Appendix A
Agency Coordination

A-1. U.S. Fish and Wildlife Service Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE
NEVADA FISH AND WILDLIFE OFFICE
1340 FINANCIAL BOULEVARD, SUITE 234
RENO, NEVADA 89502

March 17, 2003
File No. 1-5-03-SP-491

Mr. Alton Chavis
Chief, Environmental Analysis Branch
Attn: Ms. Sheryl Parker
HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley Air Force Base, Virginia 23665-2969

Dear Mr. Chavis:

Subject: Species List for the Proposed Force Structure Changes at Indian Springs Air Force Auxiliary Field, Indian Springs, Nevada

This responds to your letter dated February 18, 2003, and received in our office February 27, 2003, requesting information on threatened and endangered species and species of concern that *may* occur in the vicinity of the proposed force structure changes at Indian Springs Air Force Auxiliary Field, Indian Springs, Nevada. We have enclosed a list of threatened and endangered species that *may* be present within the vicinity of, or be affected by, the proposed land sale (Enclosure A). This list fulfills the requirement of the Fish and Wildlife Service (Service) to provide information on listed species pursuant to section 7(c) of the Endangered Species Act of 1973, as amended (Act), for projects that are authorized, funded, or carried out by a Federal agency. Please reference the species list file number shown above in all subsequent correspondence concerning this project.

Enclosure A also lists the species of concern to the Nevada Fish and Wildlife Office that may occur in the project area. The Service has used information from State and Federal agencies and private sources to assess the conservation needs and status of these species. Further biological research and field study are needed to resolve the conservation status of these taxa. One potential benefit of considering these species during project planning, is that by exploring alternatives early in the planning process, it may be possible to provide long-term conservation benefits for these species and avoid future conflicts that could otherwise develop. We also recommend that you contact the Nevada Natural Heritage Program (1550 East College Parkway, Suite 137, Carson City, Nevada 89710, 775-687-4245) and the appropriate regional office of the Nevada Division of Wildlife, as well as other local, State, and Federal agencies for distribution data and information on conservation needs on these and other species of concern that may occur in your project area. Potential impacts to species of concern should be considered during the environmental documentation process.

Enclosure B provides a discussion of the responsibilities Federal agencies have under section 7(c) of the Act and the conditions under which a biological assessment must be prepared by the lead Federal agency or its designated non-Federal representative. If the proposed project is authorized, funded, or carried out by a Federal agency, and if it is determined that a listed species may be affected by the proposed project, the Federal agency should initiate consultation pursuant to 50 CFR § 402.14. Informal consultation may be utilized prior to a written request for formal consultation to exchange information and resolve conflicts with respect to a listed species. If a biological assessment is required, and it is not initiated within 90 days of your receipt of this letter, you should informally verify the accuracy of this list with our office. If, through informal consultation or development of a biological assessment, or both, you determine that the proposed action is not likely to adversely affect the listed species, and the Service concurs in writing, then the consultation process is terminated and formal consultation is not required.

We recommend that activities resulting in surface disturbance or the removal of vegetation be timed to avoid potential destruction of active bird nests or young of birds that breed in the area. Such destruction may be in violation of the Migratory Bird Treaty Act (MBTA) (15 U.S.C. 701-718h). Under the MBTA, active nests (nests with eggs or young) of migratory birds may not be harmed, nor may migratory birds be killed. Therefore, we recommend land clearing be conducted outside the avian breeding season. If this is not feasible, we recommend a qualified biologist survey the area prior to land clearing. If active nests are located, or if other evidence of nesting (mated pairs, territorial defense, carrying nesting material, transporting food) is observed, a protective buffer (the size depending on the requirements of the species) should be delineated and the entire area avoided to prevent destruction or disturbance to nests until they are no longer active.

Should you have further questions, please contact Dan Reinkensmeyer of the Southern Nevada Field Office, at 702-515-5230.

Sincerely,

Robert D. Williams
Field Supervisor

Enclosures

cc:
Science Applications International Corp, Santa Barbara, California

ENCLOSURE A

LISTED SPECIES AND SPECIES OF CONCERN THAT MAY OCCUR WITHIN THE VICINITY OF THE PROPOSED FORCE STRUCTURE CHANGES AT INDIAN SPRINGS AIR FORCE AUXILIARY FIELD, INDIAN SPRINGS, NEVADA

File Number: 1-5-03-SP-491
March 17, 2003

Listed Species

Reptile

Desert tortoise (T)	*Gopherus agassizii*

T = Threatened

Species of Concern

Mammals

Townsend's big-eared bat	*Corynorhinus townsendii*
Spotted bat	*Euderma maculatum*
Greater western mastiff bat	*Eumops perotis californicus*
Allen's big-eared bat	*Idionycteris phyllotis*
California leaf-nosed bat	*Macrotus californicus*
Small-footed myotis	*Myotis ciliolabrum*
Long-eared myotis	*Myotis evotis*
Fringed myotis	*Myotis thysanodes*
Cave myotis	*Myotis velifer*
Long-legged myotis	*Myotis volans*
Yuma myotis	*Myotis yumanensis*
Big freetail bat	*Nyctinomops macrotis*

Birds

Western burrowing owl	*Athene cunicularia hypugea*
Gray flycatcher	*Empidonax wrightii*
Phainopepla	*Phainopepla nitens*
Lucy's warbler	*Vermivora luciae*

Reptiles

Banded Gila monster	*Heloderma suspectum cinctum*
Chuckwalla	*Sauromalus ater*

Plants

White bearpoppy	*Arctomecon merriamii*
Nye milkvetch	*Astragalus nyensis*
Clokey buckwheat	*Eriogonum heermannii* var. *clokeyi*
Delicate rockdaisy	*Perityle intricata*
Clark phacelia	*Phacelia filae*

ENCLOSURE B

FEDERAL AGENCIES' RESPONSIBILITIES UNDER SECTIONS 7 (a) and (c) OF THE ENDANGERED SPECIES ACT

SECTION 7 (a); Consultation/Conference

Requires:

1) Federal agencies to utilize their authorities to carry out programs to conserve **endangered and threatened species;**

2) Consultation with the Fish and Wildlife Service (Service) when a Federal action may affect a listed endangered or threatened species to insure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the Federal agency after determining the action may affect a listed species or critical habitat;

3) Conference with the Service when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat.

SECTION 7 (c): Biological Assessment - Major Construction Activity [4]

Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for major construction activities. The BA analyzes the effects of the action on listed and proposed species. The process begins with a Federal agency requesting from the Service a list of proposed and listed threatened and endangered species. The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the list, the accuracy of the species list should be informally verified with the Service. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. Planning, design, and administrative actions may proceed; however, no construction may begin.

We recommend the following for inclusion in the BA:

1. An onsite inspection of the area affected by the proposal which may include a detailed survey of the area to determine if the species or suitable habitat are present.

2. A review of literature and scientific data to determine species distribution, habitat needs, and other biological requirements.

3. Interviews with experts, including those within the Service, State conservation departments, universities, and others who may have data not yet published in scientific literature.

4. An analysis of the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat.

5. An analysis of alternative actions considered.

6. Documentation of study results, including a discussion of study methods used, any problems encountered, and other relevant information.

7. Conclusion as to whether or not a listed or proposed species will be affected.

Upon completion, the BA should be forwarded to our office with a request for consultation, if required.

1/ A construction project (or other major undertaking having similar physical impacts) is a major Federal action significantly affecting the quality of the human environment as referred to in NEPA (42 U.S.C. 4332 (2) C).

A-2. Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) Mailing List

APPENDIX A-2
IICEP MAILING LIST

U.S. Fish and Wildlife Service, Nevada Ecological Field Office, Field Supervisor, Reno, Nevada

U.S. Fish and Wildlife Service, Desert National Wildlife Refuge Complex, Las Vegas, Nevada

U.S. Department of Energy, Nevada Operations Office, Las Vegas, Nevada

BLM Nevada State Office, Reno, Nevada

BLM Las Vegas Field Office, Field Office Manager, Las Vegas, Nevada

Federal Aviation Administration, Las Vegas, Nevada

Humboldt/Toiyabe National Forrest, Natural Resources Officer, Sparks, Nevada

Congressman Jim Gibbons, U.S. House of Representatives

Congressman Jon Porter, U.S. House of Representatives

Senator Harry Reid, U.S. Senate

Senator John Ensign, U.S. Senate

Governor Kenny Guinn, State of Nevada

Assemblyman Chad Christensen, Nevada State Assembly

Assemblyman Kelvin Atkinson, Nevada State Assembly

Senator Mike McGinness, Nevada State Senate

Nevada Division of Wildlife, Las Vegas, Nevada

Nevada Natural Heritage Program, Carson City, Nevada

Nevada State Clearinghouse, Carson City, Nevada

Nevada State Historic Preservation Office, Carson City, Nevada

Clark County Board of Commissioners, Chairman Rory Reid

Lincoln County Board of Commissioners, Chairman Spencer Hafen

Nye County Board of Commissioners, Chairman Henry Neth

City of Las Vegas, Mayor Oscar Goodman

Las Vegas Chamber of Commerce, Las Vegas, Nevada

Las Vegas Library, Las Vegas, Nevada

City of North Las Vegas, Mayor Michael Montandon

North Las Vegas Chamber of Commerce, North Las Vegas, Nevada

North Las Vegas Library, North Las Vegas, Nevada

Beatty Chamber of Commerce, Beatty, Nevada

Indian Springs Community Center, Indian Springs, Nevada

Indian Springs Library, Indian Springs, Nevada
Benton Paiute Indian Tribe, Chairperson, The Honorable Rose Marie Saulque
Big Pine Paiute Tribe, Owens Valley, Chairperson, The Honorable Jessica Bacoch
Bishop Paiute Indian Tribe, Chairperson, The Honorable Monty Bengochia
Bishop Paiute Indian Tribe, Tribal Representative, Ms. Gaylene Moose
Chemehuevi Indian Tribe, Chairperson, The Honorable Edward Smith
Colorado River Indian Tribes, Chairperson, The Honorable Daniel Eddy, Jr.
Duckwater Shoshone Tribe, Chairperson, The Honorable Rodney Mike
Ely Shoshone Tribe, Chairperson, The Honorable Alfred Stanton
Ely Shoshone Tribe, Chairperson, Victor McQueen, Sr.
Fort Independence Indian Tribe, Chairperson
Fort Mojave Tribe, Tribal Chairperson, The Honorable Nora Helton
Fort Mojave Tribe, Tribal Representative, Mr. Felton Bricker
Kaibab Band of Southern Paiutes, Chairperson, The Honorable Carmen Bradley
Kaibab Band of Southern Paiutes, Tribal Representative, Ms. Vivienne Caron-Jake
Las Vegas Indian Center, Chairperson, Board of Directors, The Honorable Jesse Leeds
Las Vegas Paiute Tribe, Chairperson, The Honorable Gloria Hernandez
Lone Pine Paiute-Shoshone Tribe, Chairperson, The Honorable Rachel Joseph
Moapa Band of Paiutes, Chairperson, The Honorable Philbert Swain
Pahrump Paiute Tribe, Chairperson, The Honorable Richard Arnold
Paiute Indian Tribes of Utah, Chairperson, The Honorable Lora Tom
Timbisha Shoshone Tribe, Chairperson, The Honorable Leroy Jackson
Yomba Shoshone Tribe, Chairperson, The Honorable James Birchim
Yomba Shoshone Tribe, Tribal Representative, Mr. Maurice Frank-Churchill

A-3. Sample IICEP Letters

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

18 FEB 2003

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2969

The Honorable Nora Helton
Tribal Chairperson, Fort Mojave Tribe
500 Merriman Avenue
Needles CA 92363

Dear Ms. Helton:

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) for proposed force structure changes at Indian Springs Air Force Auxiliary Field (ISAFAF), Nevada. In support of this process we graciously request your input in identifying general or specific issues or areas of concern you feel should be addressed in the environmental analysis. In addition, if your agency has recently completed, is currently implementing, or is planning to undertake any new activities which you believe should be included as part of our cumulative impact analysis, we ask you to identify the activity and provide a point of contact.

ISAFAF is located approximately 45 miles northwest of Las Vegas, Nevada within the Nevada Test and Training Range. The proposal provides for beddown of additional Predator Unmanned Aerial Vehicle (UAV) units and potential beddown of T-3 trainer aircraft. The Predator UAV allows the Air Force to pursue strategic investigations and to detect potential targets without jeopardizing pilots or crews. The T-3 trainer provides proficiency training for UAV pilots and supports UAV mission-specific training tasks.

To support the beddown, approximately 200 additional personnel would be assigned and the Air Force would construct additional hangars, maintenance facilities, munitions storage, and office space at ISAFAF. Existing facilities would be expanded, improvements would be made to roadways and the aircraft-parking apron, the north end of Runway 13-31 would be extended by 400 feet, and the east gate would be upgraded to become the main gate.

Please forward any identified issues or concerns to Sheryl Parker, Predator EA Project Manager at the above address. If you have any questions about the proposal, you may contact her at (757) 764-9334 or the Nellis AFB point of contact, Mr. Jim Campe. He may be reached at 99 CES/ CEV, 4349 Duffer Drive, Ste 1601, Nellis AFB, Nevada 89191 or at (702) 652-5813. We cordially request comments be submitted by 18 March 03; however, the Air Force will consider comments received at any time during the environmental analysis process, to the extent possible. We anticipate a draft EA will be available for tribal, public, and agency comment this spring.

Alton Chavis

ALTON CHAVIS
Chief, Environmental Analysis Branch

Attachment
Location Map

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

18 FEB 2003

MEMORANDUM FOR: Mr. Robert Williams
Field Supervisor
U.S. Fish and Wildlife Service
Nevada Ecological Field Office
1340 Financial Blvd – Room 234
Reno NV 89108

FROM: HQ ACC/CEVP
129 Andrews St., Suite 102
Langley AFB VA 23665-2969

SUBJECT: Force Structure Changes at Indian Springs Air Force Auxiliary Field, Nevada

1. The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) for proposed force structure changes at Indian Springs Air Force Auxiliary Field (ISAFAF), Nevada. ISAFAF is located approximately 45 miles northwest of Las Vegas, Nevada within the Nevada Test and Training Range. The proposal provides for beddown of additional Predator Unmanned Aerial Vehicle (UAV) units and potential beddown of T-3 trainer aircraft. The T-3 trainer provides proficiency training for UAV pilots and supports UAV mission-specific training tasks.

2. Pursuant to analysis of the proposed action and in compliance with the Endangered Species Act, we are requesting information regarding federally listed threatened, endangered, candidate, and proposed to be listed species that occur or may occur in the potentially affected area. Please provide your response to Science Applications International Corporation (SAIC), Force Structure Change ISAFAF EA, 525 Anacapa Street, Santa Barbara CA 93101. We would appreciate you identifying a point of contact for any follow-up questions we may have concerning the data you provide.

3. If you have any specific concerns about the proposal, we would like to hear from you. Please contact the EA Project Manager, Sheryl Parker at the above address or at (757) 764-9334. Thank you for your assistance in this matter.

Alton Chavis
ALTON CHAVIS
Chief, Environmental Analysis Branch

Attachment
Location Map

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

18 FEB 2003

MEMORANDUM FOR: Ms. Heather Elliott
Nevada State Clearinghouse
Department of Administration
209 East Musser Street, Room 200
Carson City NV 89701

FROM: HQ ACC/CEVP
129 Andrews St., Suite 102
Langley AFB VA 23665-2969

SUBJECT: Force Structure Change at Indian Springs Air Force Auxiliary Field, Nevada

1. The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) for proposed force structure changes at Indian Springs Air Force Auxiliary Field (ISAFAF), Nevada. In support of this process we graciously request your input in identifying general or specific issues or areas of concern you feel should be addressed in the environmental analysis. In addition, if your agency has recently completed, is currently implementing, or is planning to undertake any new activities which you believe should be included as part of our cumulative impact analysis, we ask you to identify the activity and provide a point of contact.

2. ISAFAF is located approximately 45 miles northwest of Las Vegas, Nevada within the Nevada Test and Training Range. The proposal provides for beddown of additional Predator Unmanned Aerial Vehicle (UAV) units and potential beddown of T-3 trainer aircraft. The Predator UAV allows the Air Force to pursue strategic investigations and to detect potential targets without jeopardizing pilots or crews. The T-3 trainer provides proficiency training for UAV pilots and supports UAV mission-specific training tasks.

3. To support the beddown, approximately 200 additional personnel would be assigned and the Air Force would construct additional hangars, maintenance facilities, munitions storage, and office space at ISAFAF. Existing facilities would be expanded, improvements would be made to roadways and the aircraft-parking apron, the north end of Runway 13-31 would be extended by 400 feet, and the east gate would be upgraded to become the main gate.

4. Please forward any identified issues or concerns to Sheryl Parker, Predator EA Project Manager at the above address. If you have any questions about the proposal, you may contact her at (757) 764-9334. We cordially request comments be submitted by 18 March 03; however, the Air Force will consider comments received at any time during the environmental analysis process, to the extent possible. We anticipate a draft EA will be available for tribal, public, and agency comment this spring.

Alton Chavis

ALTON CHAVIS
Chief, Environmental Analysis Branch

Attachment
Location Map

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

16 FEB 2003

MEMORANDUM FOR: Indian Springs Community Center
719 Gretta Lane
Indian Springs NV 89018

FROM: HQ ACC/CEVP
129 Andrews St., Suite 102
Langley AFB VA 23665-2969

SUBJECT: Force Structure Change at Indian Springs Air Force Auxiliary Field, Nevada

1. The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) for proposed force structure changes at Indian Springs Air Force Auxiliary Field (ISAFAF), Nevada. In support of this process we graciously request your input in identifying general or specific issues or areas of concern you feel should be addressed in the environmental analysis. In addition, if your agency has recently completed, is currently implementing, or is planning to undertake any new activities which you believe should be included as part of our cumulative impact analysis, we ask you to identify the activity and provide a point of contact.

2. ISAFAF is located approximately 45 miles northwest of Las Vegas, Nevada within the Nevada Test and Training Range. The proposal provides for beddown of additional Predator Unmanned Aerial Vehicle (UAV) units and potential beddown of T-3 trainer aircraft. The Predator UAV allows the Air Force to pursue strategic investigations and to detect potential targets without jeopardizing pilots or crews. The T-3 trainer provides proficiency training for UAV pilots and supports UAV mission-specific training tasks.

3. To support the beddown, approximately 200 additional personnel would be assigned and the Air Force would construct additional hangars, maintenance facilities, munitions storage, and office space at ISAFAF. Existing facilities would be expanded, improvements would be made to roadways and the aircraft-parking apron, the north end of Runway 13-31 would be extended by 400 feet, and the east gate would be upgraded to become the main gate.

4. Please forward any identified issues or concerns to Sheryl Parker, Predator EA Project Manager at the above address. If you have any questions about the proposal, you may contact her at (757) 764-9334. We cordially request comments be submitted by 18 March 03; however, the Air Force will consider comments received at any time during the environmental analysis process, to the extent possible. We anticipate a draft EA will be available for tribal, public, and agency comment this spring.

Alton Chavis

ALTON CHAVIS
Chief, Environmental Analysis Branch

Attachment
Location Map

A-4. Agency Scoping Letters

KENNY C. GUINN
Governor

STATE OF NEVADA

JOHN P. COMEAUX
Director

DEPARTMENT OF ADMINISTRATION
209 E. Musser Street, Room 200
Carson City, Nevada 89701-4298
Fax (775) 684-0260
(775) 684-0209

March 18, 2003

Ms. Sheryl Parker, Predator EA Project Manager
HQ ACC/CEVP
129 Andrews St., Suite 102
Langley, AFB VA 23665-2969

Re: SAI NV # E2003-093

Project: Force Structure Change at Indian Springs Air Force Auxiliary Field

Dear Ms. Parker:

Enclosed are the comments from the Nevada Division of Water Resources concerning the above referenced report. These comments constitute the State Clearinghouse review of this proposal as per Executive Order 12372. Please address these comments or concerns in your final decision. If you have questions, please contact me at 684-0209.

Sincerely,

Heather K. Elliott

Heather K. Elliott
Nevada State Clearinghouse/SPOC

NEVADA STATE CLEARINGHOUSE

Department of Administration
Budget and Planning Division
209 East Musser Street., Room 200
Carson City, Nevada 89701-4298
(775) 684-0209
Fax (775) 684-0260

DATE: February 26, 2003

- Governor's Office
  - Agency for Nuclear Projects
  - Energy
- Agriculture
- Business & Industry
- Minerals
- Economic Development
- Tourism
- Fire Marshal
- Human Resources
  - Aging Services
  - Health Division
  - Indian Commission
- Colorado River Commission
- Legislative Counsel Bureau
- Information Technology
- Emp. Training & Rehab Research Div
- PUC
- Transportation
- UNR Bureau of Mines
- UNR Library
- UNLV Library
- Historic Preservation
- Emergency Management
- Office of the Attorney General
- Washington Office
- Nevada Assoc. of Counties
- Nevada League of Cities
- Nellis AFB
- Conservation-Natural Resources
  - Director's Office
  - State Lands
  - Environmental Protection
  - Forestry
  - Wildlife
    - Region 1
    - Region 2
    - Region 3
  - Conservation Districts
  - State Parks
  - [redacted]
  - Natural Heritage
  - Wild Horse Commission

Nevada SAI # E2003-093
Project: Force Structure Change at Indian Springs Air Force Auxiliary Field

[redacted]

CLEARINGHOUSE NOTES:
Enclosed, for your review and comment, is a copy of the above mentioned project. Please evaluate it with respect to its effect on your plans and programs; the importance of its contribution to state and/or local areawide goals and objectives; and its accord with any applicable laws, orders or regulations with which you are familiar.

Please submit your comments no later than March 13, 2003. Use the space below for short comments. If significant comments are provided, please use agency letterhead and include the Nevada SAI number and comment due date for our reference. Questions? Heather Elliott, 684-0209.

THIS SECTION TO BE COMPLETED BY REVIEW AGENCY:

- ___No comment on this project
- ___Proposal supported as written
- ___Additional information below
- ___Conference desired (See below)
- ___Conditional support (See below)
- ___Disapproval (Explain below)

AGENCY COMMENTS:

All waters of the State belong to the public and may be appropriated for beneficial use pursuant to the provisions of Chapters 533 and 534 of the Nevada Revised Status and not otherwise. Underground water for quasi-municipal use must be appropriated by means of the application process through the Office of the State Engineer. Indian Springs Valley is over appropriated and the State Engineer may not allow any new appropriations of water. In that case existing water rights must be purchased or leased and applications (permanent or temporary) to change the point of diversion, place and/or manner of use must be filed with the office of the State Engineer. The State Engineer may deny applications of underground water in areas where there is a municipal water source available.

William McCullars	Nevada Division of Water Resources	03/14/2003
Signature	Agency	Date

NEVADA STATE CLEARINGHOUSE

Department of Administration
Budget and Planning Division
209 East Musser Street., Room 200
Carson City, Nevada 89701-4298
(775) 684-0209
Fax (775) 684-0260

NV-0495-03
RECEIVED
FEB 2 ~ 2003
SERVICES

DATE: February 26, 2003

Governor's Office	Legislative Counsel Bureau	Conservation-Natural Resources
Agency for Nuclear Projects	Information Technology	Director's Office
Energy	Emp Training & Rehab Research Div	State Lands
Agriculture	PUC	Environmental Protection
Business & Industry	Transportation	Forestry
Minerals	UNR Bureau of Mines	Wildlife
Economic Development	UNR Library	Region 1
Tourism	UNLV Library	Region 2
Fire Marshal	Historic Preservation	Region 3
Human Resources	Emergency Management	Conservation Districts
Aging Services	Office of the Attorney General	State Parks
Health Division	Washington Office	Water Resources
Indian Commission	Nevada Assoc. of Counties	Natural Heritage
Colorado River Commission	Nevada League of Cities	Wild Horse Commission
	Nellis AFB	

Nevada SAI # E2003-093
Project: Force Structure Change at Indian Springs Air Force Auxiliary Field

[redacted]

CLEARINGHOUSE NOTES:
Enclosed, for your review and comment, is a copy of the above mentioned project. Please evaluate it with respect to its effect on your plans and programs, the importance of its contribution to state and/or local areawide goals and objectives; and its accord with any applicable laws, orders or regulations with which you are familiar.

Please submit your comments no later than **March 17, 2003.** Use the space below for short comments. If significant comments are provided, please use agency letterhead and include the Nevada SAI number and comment due date for our reference. Questions? Heather Elliott, 684-0209.

THIS SECTION TO BE COMPLETED BY REVIEW AGENCY:

____No comment on this project	____Conference desired (See below)
____Proposal supported as written	____Conditional support (See below)
____Additional information below	____Disapproval (Explain below)

AGENCY COMMENTS:

- The Bureau of Health Protection Services comments: Compliance with NAC 445A.65505 through 445A.67765, Design and Construction for Public Water Systems, must be considered regarding the proposed project.

Signature

Health Division
Agency

3-31-03
Date

KENNY C. GUINN
Governor

STATE OF NEVADA

JOHN P. COMEAUX
Director

DEPARTMENT OF ADMINISTRATION
209 E. Musser Street, Room 200
Carson City, Nevada 89701-4298
Fax (775) 684-0260
(775) 684-0209

April 8, 2003

Ms. Sheryl Parker, Predator EA Project Manager
HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2969

Re: SAI NV #E2003-093

Project: Force Structure Change at Indian Springs Air Force Auxiliary Field

Dear Ms. Parker:

Attached is an additional comment from the Nevada State Health Division, Bureau of Health Protection Services, which was received after our previous letter to you. Please incorporate this comment into your decision making process. If you have any questions, please contact me at (775) 684-0209.

Sincerely,

for Heather K. Elliott
Nevada State Clearinghouse/SPOC

Attachment

STATE OF NEVADA
DEPARTMENT OF CULTURAL AFFAIRS
Nevada State Historic Preservation Office
100 N. Stewart Street
Carson City, Nevada 89701

KENNY C. GUINN
Governor

SCOTT K. SISCO
Interim Director

RONALD M. JAMES
State Historic Preservation Officer

March 25, 2003

Alton Chavis
Chief Environmental Analysis Branch
HQ ACC/CEVP
129 Andrews St. Suite 102
Langley AFB VA 23665-2969

RE: Force Structure Changes at Indian Springs Air Force Auxiliary Field, Indian Springs Area, Clark County.

Dear Alton Chavis:

The Nevada State Historic Preservation Office (SHPO) reviewed your request for comments on the proposed alterations to the Indian Springs complex. The SHPO notes that the complex has been inventoried for cultural resources and numerous eligible architectural and archaeological resources were recorded as a result of this effort. If any of these properties are still present, the SHPO recommends that the effect of the expansion should be considered in the planning process.

The SHPO could not determine if the area for the proposed expansion of the north end of Runway 13-31 has been surveyed for cultural resources. If this area has not been inventoried, the SHPO would recommend an archaeological inventory of the project area.

If you have any questions concerning this correspondence, please contact me by phone at (775) 684-3443 or by E-mail at rlpalmer@clan.lib.nv.us.

Sincerely,

Rebecca Lynn Palmer
Historic Preservation Specialist

KENNY C. GUINN
Governor

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF WILDLIFE
1100 Valley Road
Reno, Nevada 89512
(775) 688-1500 • Fax (775) 688-1595

R. MICHAEL TURNIPSEED, P.E.
Director
Department of Conservation
and Natural Resources

TERRY R. CRAWFORTH
Administrator

SOUTHERN REGION
4747 WEST VEGAS DRIVE
LAS VEGAS, NEVADA 89108
(702) 486-5127; 486-5133 FAX

March 31, 2003

Mr. Michael Estrada
Project Officer, Air Warfare Center
4370 N Washington Blvd Ste. 117
Nellis AFB NV 89191-7076

RE: Indian Springs Air Force Auxiliary Field force structure changes

Dear Mr. Estrada.

Thank you for bringing this public notice to our attention. The Nevada Division of Wildlife (NDOW) recognizes the importance of testing and training for our armed forces, particularly during wartime. We do not anticipate any long-term, significant negative impacts to wildlife species or habitats of concern as a result of this project. There are sparse stands of Catclaw acacia (Acacia greggii) and Mesquite (Prosopis, sp.) on the south side of U.S. 95 adjacent to the airfield that is potential habitat for neo-tropical migrating bird species. For information on protected plant species in Nevada, you may want to contact Mr. John Jones of the Nevada Division of Forestry at:

Nevada Division of Forestry
4747 W. Vegas Drive
Las Vegas, NV 89108
(702) 486-5125

As for animal and plant species afforded protection under the Federal Endangered Species Act of 1973, you may find it helpful to contact the local office of the U.S. Fish and Wildlife Service at:

U.S. Fish and Wildlife Service
Nevada Ecological Services
4701 N. Torrey Pines Dr.
Las Vegas, NV 89130
(702) 451-5230

If you have any questions, I can be contacted at (702)-486-5127 ext. 3613. Again, thank you for the opportunity to comment on this project relative to Nevada's wildlife and habitat resources.

Sincerely,

Roddy Sheppard
Habitat Biologist

RS:ra

cc: NDOW, Game Bureau
NDOW, Habitat Bureau

Appendix B

Statutes, Regulations, and Guidelines

APPENDIX B
RELEVANT STATUTES, REGULATIONS, AND GUIDELINES

GENERAL

National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190, 42 U.S.C. 4347, as amended) requires federal agencies to take the environmental consequences of proposed actions into consideration in their decisionmaking process. The intent of NEPA is to protect, restore, or enhance the environment through well-informed federal decisions. The Council on Environmental Quality (CEQ) was established under NEPA to implement and oversee federal policy in this process.

32 CFR 989, et seq., Environmental Impact Analysis Process (formerly known as Air Force Instruction [AFI] 32-7061) is the Air Force implementation of the procedural provisions of the NEPA and CEQ regulations.

AFPD 32-70, Environmental Quality, requires that the Air Force comply with applicable federal, state, and local environmental laws and regulations, including NEPA. Executive Order (EO) 11514, Protection and Enhancement of Environmental Quality, as amended by EO 11991, sets policy directing the federal government in providing leadership in protecting and enhancing the environment.

Executive Order 12372 (Intergovernmental Review of Federal Programs) directs federal agencies to "make efforts to accommodate state and local elected officials' concerns with proposed . . . direct federal development." It further states, "for those cases where the concerns cannot be accommodated, federal officials shall explain the bases for their decision in a timely manner." The executive order requires federal agencies to provide state and local officials the opportunity to comment on actions that could affect their jurisdictions, using state-established consultation processes when possible.

AIRSPACE

Federal Aviation Act of 1958 created the Federal Aviation Administration (FAA) and charged the FAA Administrator with ensuring the safety of aircraft and the efficient utilization of the National Airspace System, within the jurisdiction of the United Sates.

Federal Aviation Regulation (Part 71) (1975) delineates the designation of federal airways, area low routes, controlled airspace, and navigational reporting points.

Federal Aviation Regulation (Part 73) (1975) defines special use airspace and prescribes the requirements for the use of that airspace.

Federal Aviation Regulation (Part 91) (1990) describes the rules governing the operation of aircraft within the United Sates.

FAA Handbook 7400.2C prescribes policy, criteria, and procedures applicable to rulemaking and non-rulemaking actions associated with airspace allocation and utilization, obstruction evaluation and marking airport airspace analyses, and the establishment of air navigation aids.

FAA Handbook 7110.65 prescribes air traffic control procedures and phraseology for use by personnel providing air traffic control services in the United States.

SAFETY

AFI 32-2001 defines the requirements for Air Force installation fire protection programs, including equipment, response times, and training.

AFI 32-3001, Explosive Ordnance Disposal Program (1 October 1999), regulates and provides procedures for explosives safety and handling.

AFI 91-202, the U.S. Air Force Mishap Prevention Program (1 August 1998) established mishap prevention program requirements, assigns responsibilities for program elements, and contains program management information.

AFI 91-301 contains Air Force occupational safety, fire prevention, and health regulations governing a wide range of activities and procedures associated with safety in the workplace.

Air Force Manual 91-201 regulates and provides procedures for explosives safety and handling. This manual defines criteria for quantity distances, clear zones, and facilities associated with ordnance.

Department of Defense (DOD) Flight Information Publication indicates locations of potential hazards (e.g., bird aggregations, obstructions) and noise sensitive locations under military airspace, and defines horizontal and/or vertical avoidance measures. This publication is updated monthly to present current conditions.

MATERIALS MANAGEMENT

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, and ***SARA of 1986*** provide liability and compensation for cleanup and emergency

response from hazardous substances discharged into the environment and the cleanup of hazardous disposal sites.

Resource Conservation and Recovery Act (RCRA) of 1976 regulates storage, transportation, treatment, and disposal of hazardous waste that could adversely affect the environment.

Solid Waste Disposal Act (SWDA) and Amendments of 1980 amends RCRA with additional regulation of energy and materials conservation and the establishment of a National Advisory Council.

AFI 32-4002 (Hazardous Material, Emergency Planning and Response Program) (December 1997)

AFI 32-7005 Facility Environmental Protection Committee (25 February 1994).

AFI 32-7042 (Solid and Hazardous Waste Compliance) (May 1994)

AFI 32-7080 (Pollution Prevention Program) (May 1994)

AFI 32-7086 (Hazardous Material Management) (August 1997)

Military Munitions Rule, Title 40 CFR Part 266, Subpart M.

PHYSICAL RESOURCES

Federal Water Pollution Control Act of 1948. Establishes procedures and programs for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters, thus protecting habitat conditions in aquatic and wetland ecosystems.

Clean Water Act of 1977 (33 USC section 1251 et seq.) requires that any point source waste that discharges into waters of the U.S. requires a National Pollutant Discharge Elimination System (NPDES) permit. Section 404 of this act regulates development in streams and wetlands and requires a permit from the U.S. Army Corps of Engineers prior to such activities.

Executive Order 11988 (Flood Plain Management) directs that "any federally undertaken, financed, or assisted construction project must provide leadership and take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains." This order requires each federal agency to determine whether the project will occur in a floodplain and to consider alternatives. If no practical alternative is

found, it requires minimizing harm and notifying the public as to why the project must be located in the floodplain. It also provides for public review and comment.

Safe Drinking Water Act of 1974 (42 USC section 300f et seq.) requires the Environmental Protection Agency (EPA) to establish a program which provides for the safety of the nation's drinking water. Regulations under this act can be found in 40 CFR, section 141 et seq.

BIOLOGICAL RESOURCES

Executive Order 11990 (Protection of Wetlands) (1977) requires that leadership shall be provided by involved agencies to minimize the destruction, loss, or degradation of wetlands. The order was issued to "avoid to the extent possible the long and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands whenever there is a practicable alternative." Federal agencies are required to provide for early public review of any plans or proposals for new construction in wetlands.

AFI 32-7064 (Integrated Natural Resources Management) implements Air Force Policy Directive 32-70, Environmental Quality. This instruction explains how to manage natural resources on Air Force property in compliance with federal, state, and local standards in the U.S. and U.S. territories and possessions.

Bald Eagle Protection Act *(*16 USC 668-668d) addresses the protection of bald and golden eagles and specifies criminal penalties.

Endangered Species Act of 1973 (16 USC section 1531 et seq. as amended) protects proposed and listed threatened or endangered species. Formal consultation with the U.S. Fish and Wildlife Service (USFWS) is required under Section 7 of the act for federal projects and all other projects that require federal permits (e.g., U.S. Army Corps of Engineers permits) where such actions could directly or indirectly affect any proposed or listed species.

Executive Order 12088 (Federal Compliance with Pollution Control Standards) (1988) requires the head of each executive agency to be responsible for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution with respect to federal facilities and activities under the control of the agency.

Fish and Wildlife Conservation Act *(1980)* promotes state programs to conserve, restore, and benefit non-game fish and wildlife and their habitat.

Migratory Bird Treaty Act of 1972 (16 USC sections 703 through 711) federally protects all birds including (but not limited to) hawks, eagles, falcons, shorebirds, wading birds, owls, waterfowl, and songbirds by limiting the transportation, importation, killing, or possession of those birds.

AIR QUALITY

Clean Air Act (Title 40 CFR parts 50 and 51), amended in August 1977 and November 1990, dictates that the National Ambient Air Quality Standards (NAAQS) must be maintained nationwide. The Act delegates authority to state and local agencies to enforce the NAAQS and to establish air quality standards and regulations of their own. The adopted state standards and regulations must be at least as restrictive as the federal requirements. Air pollution sources within the study area are regulated by the Nevada Department of Environmental Protection. Although mobile sources such as aircraft are exempt from air pollution permitting requirements, the operation of these sources must comply with state and federal regulation and the ambient air quality standard.

Executive Order 12088 (Federal Compliance with Pollution Control Standards) requires the head of each executive agency to be responsible for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution with respect to federal facilities and activities under the control of the agency.

CULTURAL RESOURCES

National Historic Preservation Act (NHPA) of 1966 establishes National Register of Historic Places (National Register) and defines the Section 106 process requiring federal agencies to consider effects of an action on cultural resources on or eligible for the National Register.

Protection of Historic and Cultural Properties *(*36 CFR section 800) (1986) provides an explicit set of procedures for federal agencies to meet their obligations under the NHPA and Executive Order 11593.

Native American Graves Protection and Repatriation Act (NAGPRA) (1990*)* (25 USC 3001-3013) requires protection and repatriation of Native American cultural items found on, or taken from federal or tribal lands, and requires repatriation of cultural items controlled by federal agencies or museums receiving federal funds.

Archaeological Resources Protection Act (ARPA) of 1979 (16 USC section 470aa-47011) ensures the protection and preservation of archaeological sites on federal or Native American lands.

AFI 32-7065 (Cultural Resources Management) implements Air Force Policy Directive 32-70, Environmental Quality. This instruction sets guidelines for protecting and managing cultural resources in the United States and U.S. territories and possessions.

Executive Order 13007 (1996) directs agencies responsible for managing federal lands to, "(1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and (2) avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites." The order also requires that reasonable notice is given for proposed actions or policies potentially restricting access to, or adversely affecting sacred sites.

AF Manual 126-5 (Natural Resources, Outdoor Recreation, and Cultural Values) provides guidance, standards, and technical information on management of natural resources, outdoor recreational resources, and cultural resources.

AF Policy Letter (4 January 1982) establishes that it is Air Force policy to comply with historic preservation and other federal environmental laws and directives, including Historic Sites Act of 1935; NHPA of 1966, as amended; NEPA of 1969; Archaeological and Historic Preservation Act of 1974; ARPA of 1979; and Executive Order 11593.

American Indian Religious Freedom Act (AIRFA) (1978) (42 USC section 1996) states that it is the policy of the U.S. to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites.

Executive Order 11593 (1971) directs land-holding federal agencies to identify and nominate historic properties to the National Register and requires that these agencies should avoid damaging historic properties that might be eligible for the National Register.

ENVIRONMENTAL JUSTICE

Executive Order 12898 (Environmental Justice) directs federal agencies to achieve environmental justice by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations in the United States and its territories and possessions. The order creates an Interagency Working Group on Environmental Justice and directs each federal agency to develop strategies within prescribed time limits to identify and address environmental justice concerns. The order further directs each federal agency to collect, maintain, and analyze information on the race, national origin, income level, and other readily accessible and appropriate information for areas surrounding facilities or sites expected to have a substantial environmental, human

health, or economic effect on the surrounding populations, when facilities or sites become the subject of a substantial federal environmental administrative or judicial action and to make such information publicly available.

EO 13045 Protection of Children from Environmental Health Risks and Safety Risks (1998) directs federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children.

AF Guidance, Interim Guide for Environmental Justice Analysis with the Environmental Impact Analysis Process (November 1997) provides guidance for implementation of EO 12898 in relevant Air Force environmental impact assessments.

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Appendix C

Environmental Restoration Program Waiver

NOTE: An Environmental Restoration Program (ERP) waiver letter has been submitted to Headquarters Air Combat Command (ACC). Approval is expected by June 2003. A copy will be provided in the Final EA.

Appendix D

Air Quality Technical Appendix

APPENDIX D
AIR QUALITY TECHNICAL REPORT

The approach to the air quality analysis was to estimate the change in emissions due to the proposed action and alternatives. Criteria to determine the significance of air quality impacts are based on federal, state, and local air pollution standards and regulations. Air quality impacts from a proposed activity or action would be significant if they:

- increase ambient air pollution concentrations above any NAAQS;
- contribute to an existing violation of any NAAQS;
- interfere with or delay timely attainment of NAAQS; or
- impair visibility within any federally mandated PSD Class I area.

In attainment areas, Prevention of Significant Deterioration (PSD) rules define a stationary source as "major" if annual emissions exceed 250 tons per year of VOCs, NOx, CO, SOx, or PM_{10}. In serious nonattainment areas, New Source Review (NSR) rules define a stationary source as "major" if annual emissions exceed 50 tons of VOCs or NO_x and 100 tons of CO, sulfur oxides (SOx), or PM_{10}. For purposes of this air quality analysis, project emissions would be potentially significant if they exceed one of these thresholds. This is a conservative approach, as the project includes both stationary and mobile (non-permitted) emission sources, whereas these thresholds only apply to stationary sources.

According to the USEPA General Conformity Rule in 40 CFR Part 51, Subpart W, any proposed federal action that has the potential to impact air quality, as described above, in a nonattainment or maintenance area must undergo a conformity analysis. Under this rule, air quality impacts would be potentially significant if project emissions exceed one of the thresholds that trigger a conformity analysis (70 tons per year of PM_{10} and 100 tons per year of CO for CO and PM_{10} serious nonattainment areas). A conformity analysis is not required in an attainment area. Since ISAFAF is located outside of the nonattainment area in Clark County, a conformity analysis is not required for activities occurring in the Indian Springs locale. Emissions from the proposed construction of munitions storage structures at Nellis AFB would be potentially significant if they exceed the conformity thresholds described above, since these activities occur in a nonattainment area.

As previously discussed, Section 169A of the CAA established the PSD regulations to protect the air quality in regions that already meet the NAAQS. Certain national parks, monuments, and wilderness areas have been designated as PSD Class I areas, where appreciable deterioration in air quality is considered significant. The nearest PSD Class I area is the Grand Canyon National Park in Arizona, which is located approximately 100 miles east from the region potentially affected by the proposed action and alternatives. Therefore, the proposed action would not have a significant impact on a PSD Class I area.

1.0 ALTERNATIVE A

Alternative A involves the beddown of additional Predator medium altitude (MQ-1) and the introduction of high altitude (MQ-9) endurance UAVs at the ISAFAF. Under this alternative,

some new facilities would be built and others would be modified to accommodate the Predator aircraft's support and maintenance requirements. The addition of UAV would result in an increase of aircraft operations and emissions resulting from these operations. The proposed action would result in an increase of 101 full-time personnel. Construction and renovation activities would occur at the site to accommodate the additional aircraft, including extension of Runway 13/31. Stationary air emission sources such as generators for the ground support equipment (GSE) would also occur at the site as necessary to accommodate the aircraft.

1.1 Construction Emissions

Under Alternative A, construction activities at ISAFAF include grading and construction of facilities, taxiway and runway with a combined floor space of approximately 837,000 square feet. These construction activities would occur over a 4-year period and would produce short-term combustive and fugitive dust emissions, which would cease once construction is completed. Construction activities at Nellis AFB include grading and construction of three munitions storage structures. These activities would occur during FY06.

Emissions of VOC, NO_x, CO, and PM_{10} from construction activities were calculated using emission factors for grading and for general industrial construction (SCAQMD 1993). These emissions include exhaust emissions from on-site construction equipment as well as fugitive dust emissions from grading activities. A summary of the annual construction emissions for each construction year is presented in Table 1.

Table 1. Annual Construction Emissions under Alternative A

Construction	*CRITERIA POLLUTANTS EMISSIONS (TONS PER YEAR)*				
	CO	***SO_2****	***NO_2***	***PM_{10}***	***VOC***
FY 03 Construction Projects (ISAFAF)	12.3	NA	46.3	61.3	3.7
FY 04 Construction Projects (ISAFAF)	6.5	NA	29.8	60.1	2.0
FY 05 Construction Projects (ISAFAF)	7.5	NA	31.4	60.2	2.3
FY 06 Construction Projects (ISAFAF)	9.9	NA	45.7	61.2	3.1
FY 06 Construction Projects (Nellis AFB)	0.4	NA	1.7	0.1	0.1
Emission factor for SO_2 is not available. SO_2 emissions from construction activities, however, are expected to be insignificant.					

As shown in Table 1, construction operations at ISAFAF would generate emissions for CO, SO_2, NO_2, PM_{10}, and VOC well below the PSD threshold of 250 tons per year. Construction operations at Nellis AFB would also generate low-level emissions, well below the conformity thresholds of 50 tons of VOCs or NO_x and 100 tons of CO, sulfur oxides (SOx), or PM_{10}. The actual emissions are likely to be less than the estimated emissions (Table 1) due to implementation of additional control measures in concert with standard Best Management Practices (BMPs). For instance, frequent spraying of water on exposed soil during construction is a standard procedure that could be used to minimize the amount of dust generated during construction. Combustive and fugitive dust emissions would produce localized, short-term elevated air pollutant concentrations, which would not result in long-term impacts on the air quality of Clark County.

1.2 Commuter Vehicle Emissions

The current use of Air Force buses to transport commuting personnel from the Las Vegas area to ISAFAF would continue under the proposed action. This commuting practice is expected to reduce the number of privately owned vehicles (POVs) operating from the Las Vegas area on the U.S. 95 corridor. The number of buses used for commuting is based upon the number of personnel desiring the service and the pick-up points along the route of transport. For calculation purposes, it was assumed that 75 percent of commuting personnel would drive to a pick-up point along the U.S. 95 and take a bus to ISAFAF, while the remaining 25 percent would commute to ISAFAF in POVs. An average bus capacity of 50 persons was assumed.

Implementation of the proposed action under Alternative A would result in the addition of 101 full-time personnel at ISAFAF. The resultant increase in commuting emissions, due to vehicular travel by these new full-time personnel to and from the base, were calculated using emission factors from *Calculation Methods for Criteria Pollutant Emission Inventories* (Jagelski and O'Brien 1994). All POVs were assumed to be light-duty, gasoline-powered vehicles with 1995 as the average vehicle model year. All busses were assumed to be heavy duty, diesel-powered vehicles with 1995 as the model year. Annual criteria pollutant emissions from vehicles commuting of 101 full-time personnel to and from ISAFAF, assuming an average round-trip commuting distance of 90 miles from the Las Vegas area, are shown in Table 2.

Table 2. Emissions from Commuter Vehicles under Alternative A

Source	*POLLUTANTS (TONS PER YEAR)*				
	CO	***SO_2***	***NO_2***	***PM_{10}***	***VOC***
Commuting POVs	15.8	0.004	1.3	0.06	2.2
Commuting Busses	0.7	0.003	0.4	0.06	0.2
Total Emissions	**16.4**	**0.01**	**1.7**	**0.1**	**2.3**

As shown in Table 2, emissions from commuting vehicles to and from ISAFAF would generate low-level emissions for CO, SO_2, NO_2, PM_{10}, and VOC, well below the PSD threshold of 250 tons per year. Since emissions from commuting vehicles would be spread over a 45-mile distance, they would not result in long-term impacts on the air quality of Clark County.

1.3 Aircraft Operations

Under Alternative A, the beddown of additional Predator UAVs would result in an increase of 1,908 sorties per year in the NTTR airspace and 786 sorties per year in the R-2508 airspace in California. Aircraft sorties for the Predator UAVs include takeoff and landing (LTO), touch and go (TGO), and transit and mission operations. All LTOs and TGOs would occur at ISAFAF. Predators would take off at ISAFAF and transit in the NTTR airspace at an altitude of 15,000 feet or greater. Some Predator sorties would take off at ISAFAF and fly at an altitude of 15,000 feet or greater to the R-2508 Range Complex north of Edwards AFB, in California, for transit and mission, and then come back to land at ISAFAF.

At this time, published emission data are not available for the Predator Rotax engines. Emission factors for similar engines from EPA's AP-42 document (Vol. II) (EPA, 1992) were

used to estimate emissions from the Predator. The emission factor for the Lycoming O-320 engine was used to calculate emissions from the RQ-1 and MQ-1 UAVs. This engine is used on the Piper PA-18 aircraft. The emission factor for the DeHaviland PT-6A-27 was used to calculate emissions from the MQ-9 UAVs. This engine is used on the UV-18A aircraft.

Emissions from aircraft LTO and TGO operations were estimated based on the assumption that each sortie would consist of one LTO and five TGOs and would last a total of 6 hours. LTO and TGO operations would result in emissions within the ISAFAF locale. Emissions from transit and mission operations in NTTR and R-2508 airspace were estimated based on the assumption that the Predators would spend 4.5 hours in NTTR airspace and 4 hours in R-2508 airspace. However, these emissions would occur at an altitude of 15,000 feet or greater, well above the mean maximum mixing heights for those areas, which are 2,000 feet (winter) to 12,000 feet (summer) for NTTR and 3,000 feet (winter) to 8,000 feet (summer) for R-2508 (Holzworth, 1964). Therefore, emissions from transit and mission operations would not impact the air quality of the NTTR and R-2508 locales, since they would occur at a very high altitude and would spread out over large areas. A summary of emissions from proposed aircraft operations under Alternative A is presented in Table 3.

Table 3. Emissions from Aircraft Operations under Alternative A

Source	Pollutants (Tons per Year)				
	CO	SO_2	NO_2	PM_{10}	VOC
Baseline					
LTO and TGOs (ISAFAF)	56.1	0.01	0.1	0.05	0.8
NTTR	160.1	0.02	0.6	0.2	2.0
R-2508	22.9	0.003	0.1	0.02	0.3
Alternative A					
LTO and TGOs (ISAFAF)	159.1	0.1	0.9	0.2	2.5
NTTR	396.8	0.2	3.6	0.7	5.0
R-2508	113.3	0.1	1.0	0.2	1.4
Increase from Baseline					
LTO and TGOs (ISAFAF)	103.0	0.1	0.8	0.2	1.8
NTTR	236.6	0.2	2.9	0.5	3.0
R-2508	90.4	0.1	0.9	0.2	1.1

As shown in Table 3, LTO and TGOs aircraft operations at ISAFAF would generate emissions for CO, SO_2, NO_2, PM_{10}, and VOC below the PSD threshold of 250 tons per year. These emissions would not result in long-term impacts on the air quality of Clark County. Emissions from transit and mission operations in NTTR and R-2508 airspace would not affect ground level air quality, since they would occur at a very high altitude (above the mean maximum mixing height for those areas) and would spread out over large areas.

1.4 Ground Support Equipment (GSE)

Emissions from GSE under Alternative A were calculated based on the emission data and assumptions provided in the 1996 EA for the beddown of 25 additional Predators at ISAFAF (USAF 1996). Under this alternative, an increase of 2,694 sorties per year for Predator UAVs operating out of ISAFAF would occur. It was assumed that no more than two 40 kW GSE generators would be running at one time. For calculation purposes, it was assumed that for a typical aircraft sortie of 6 hours the generators would have to run for a period of 8 hours to complete the mission. Emission factors for generators from EPA's AP-42 document (Vol I) were used to calculate emissions from GSE. A summary of the emissions from GSE is presented in Table 4.

Table 4. Emissions from Ground Support Equipment under Alternative A

Source	*POLLUTANTS (TONS PER YEAR)*				
	CO	***SO_2***	***NO_2***	***PM_{10}***	***VOC***
Ground Support Equipment	7.7	2.4	35.7	2.5	2.9

As shown in Table 4, GSE would generate low-level emissions for CO, SO_2, NO_2, PM_{10}, and VOC, well below the PSD thresholds of 250 tons per year. These emissions would not result in long-term impacts on the air quality of Clark County.

1.5 Total Annual Operational Emissions under Alternative A

A summary of total annual operational emission increases from the implementation of Alternative A at ISAFAF is presented in Table 5.

Table 5. Total Annual Operational Emission Increases under Alternative A

Source	*POLLUTANTS (TONS PER YEAR)*				
	CO	***SO_2***	***NO_2***	***PM_{10}***	***VOC***
Commuting Vehicles	16.4	0.01	1.7	0.1	2.3
Aircraft Operations (ISAFAF)	103.0	0.1	0.8	0.2	1.8
Ground Support Equipment	7.7	2.4	35.7	2.5	2.9
Total Emissions (ISAFAF)	**127.2**	**2.4**	**38.2**	**2.8**	**6.9**

2.0 ALTERNATIVE B

As in Alternative A, this alternative involves the beddown of additional Predator UAVs at ISAFAF. The difference between this alternative and Alternative A is the number and type of Predator UAV that would be added. This would result a higher number of annual aircraft operations and an increase of 143 full-time personnel commuting to ISAFAF. Stationary air emission sources such as generators for GSE would also occur as necessary to accommodate the aircraft. The proposed action would result in the same construction and renovation activities required under Alternative A to accommodate the additional aircraft, including extension of Runway 13/31.

2.1 Construction Emissions

Emissions from construction activities under Alternative B would be the same as those presented in Table 1 for Alternative A. As shown in Table 1, construction operations at ISAFAF would generate emissions for CO, SO_2, NO_2, PM_{10}, and VOC well below the PSD threshold of 250 tons per year. Construction operations at Nellis AFB would also generate low-level emissions, well below the conformity thresholds of 50 tons of VOCs or NO_x and 100 tons of CO, sulfur oxides (SOx), or PM_{10}. The actual emissions are likely to be less than the estimated emissions (Table 1) due to implementation of additional control measures in concert with standard construction practices. For instance, frequent spraying of water on exposed soil during construction is a standard procedure that could be used to minimize the amount of dust generated during construction. Combustive and fugitive dust emissions would produce localized, short-term elevated air pollutant concentrations, which would not result in long-term impacts on the air quality of Clark County.

2.2 Commuter Vehicle Emissions

Implementation of the proposed action under this alternative would result in the addition of 143 full-time personnel at ISAFAF. The resultant increase in commuting emissions, due to vehicular travel by these new personnel to and from the base, were calculated using emission factors from *Calculation Methods for Criteria Pollutant Emission Inventories* (Jagelski and O'Brien, 1994). All POVs were assumed to be light-duty, gasoline-powered vehicles with 1995 as the average vehicle model year. Busses were assumed to be heavy duty, diesel-powered vehicles with 1995 as the model year. Annual criteria pollutant emissions from vehicles commuting of 143 full-time personnel to and from ISAFAF, assuming an average round-trip commuting distance of 90 miles from the Las Vegas metropolitan area, are shown in Table 6.

Table 6. Emissions from Commuter Vehicles under Alternative B

Source	*POLLUTANTS (TONS PER YEAR)*				
	CO	***SO_2***	***NO_2***	***PM_{10}***	***VOC***
Commuting POVs	22.3	0.01	1.8	0.1	3.1
Commuting Busses	1.0	0.005	0.6	0.1	0.3
Total Emissions	**23.3**	**0.01**	**2.4**	**0.2**	**3.3**

As shown in Table 6, emissions from commuting vehicles to and from ISAFAF would generate low-level emissions for CO, SO_2, NO_2, PM_{10}, and VOC, well below the PSD threshold of 250 tons per year. Since the emissions from commuting vehicles would be spread over a 45-mile distance, they would not result in long-term impacts on the air quality of Clark County.

2.3 Aircraft Operations

Emissions from aircraft operations for Alternative B were calculated based on the same emission data and assumptions provided under Alternative A. Under Alternative B, the beddown of additional Predator UAVs would result in an increase of 2,640 sorties per year in the NTTR airspace and 786 sorties per year in the R-2508 airspace. A summary of emissions from proposed aircraft operations under Alternative B is presented in Table 7.

Table 7. Emissions from Aircraft Operations under Alternative B

Source	Pollutants (Tons Per Year)				
	CO	SO_2	NO_2	PM_{10}	VOC
Baseline					
LTO and TGOs (ISAFAF)	56.1	0.01	0.1	0.05	0.8
NTTR	160.1	0.02	0.6	0.2	2.0
R-2508	22.9	0.003	0.1	0.02	0.3
Alternative B					
LTO and TGOs (ISAFAF)	164.6	0.1	1.8	0.4	3.2
NTTR	427.1	0.5	7.0	1.2	5.3
R-2508	98.0	0.1	1.6	0.3	1.2
Increase from Baseline					
LTO and TGOs (ISAFAF)	108.4	0.1	1.7	0.3	2.4
NTTR	267.0	0.4	6.4	1.0	3.3
R-2508	75.0	0.1	1.5	0.3	0.9

As shown in Table 7, LTO and TGOs aircraft operations at ISAFAF would generate emissions for CO, SO_2, NO_2, PM_{10}, and VOC below the PSD threshold of 250 tons per year. These emissions would not result in long-term impacts on the air quality of Clark County. Emissions from transit and mission operations in NTTR and R-2508 airspace would not affect ground level air quality, since they would occur at a very high altitude (above the mean maximum mixing height for those areas) and would spread out over large areas.

2.4 Ground Support Equipment (GSE)

Emissions from GSE under this alternative were calculated based on the emission data and assumptions provided under Alternative A. Under this alternative, the beddown of additional Predator UAV would result in an increase of 3,426 sorties per year for Predator UAVs operating out of ISAFAF. A summary of the emissions from GSE is presented in Table 8.

Table 8. Emissions from Ground Support Equipment under Alternative B

Source	Pollutants (Tons per Year)				
	CO	SO_2	NO_2	PM_{10}	VOC
Ground Support Equipment	9.8	3.0	45.4	3.2	3.6

As shown in Table 8, GSE at ISAFAF would generate low-level emissions of CO, SO_2, NO_2, PM_{10}, and VOC, well below the PSD thresholds of 250 tons per year. These emissions would not result in long-term impacts on the air quality of Clark County.

2.5 Total Annual Operational Emissions under Alternative B

A summary of total annual operational emission increases from the implementation of Alternative B at ISAFAF is presented in Table 9.

Table 9. Total Annual Operational Emission Increases under Alternative B

Source	*POLLUTANTS (TONS PER YEAR)*				
	CO	***SO_2***	***NO_2***	***PM_{10}***	***VOC***
Commuter Vehicles	23.3	0.01	2.4	0.2	3.3
Aircraft Operations (ISAFAF)	108.4	0.1	1.7	0.3	2.4
Ground Support Equipment	9.8	3.0	45.4	3.2	3.6
Total Emissions (ISAFAF)	**141.5**	**3.2**	**49.5**	**3.7**	**9.3**

3.0 ALTERNATIVE C

Alternative C involves the beddown of 20 percent more Predator UAVs at ISAFAF. The reduced operational requirements would result in a decrease of approximately 560 personnel commuting to ISAFAF. Stationary air emissions sources such as generators would not be detectably different from the No Action Alternative. Alternative C includes the extension of Runway 13/31 to support Predator crosswind operation.

3.1 Construction Emissions

Under Alternative C, construction activities at ISAFAF include grading and construction of facilities, taxiway and runway with a combined floor space of approximately 304,000 square feet. These construction activities would occur during FY03, FY05, and FY06 and would produce short-term combustive and fugitive dust emissions, which would cease once construction is completed. A summary of the annual emissions from construction activities under Alternative C is presented in Table 10.

Table 10. Annual Construction Emissions under Alternative C

Construction	*CRITERIA POLLUTANTS EMISSIONS (TONS PER YEAR)*				
	CO	***SO_2****	***NO_2***	***PM_{10}***	***VOC***
FY 03 Construction Projects (ISAFAF)	1.3	NA	1.5	28.2	0.4
FY 05 Construction Projects (ISAFAF)	0.9	NA	1.1	28.1	0.2
FY 06 Construction Projects (ISAFAF)	5.1	NA	21.0	29.6	1.6
* Emission factor for SO_2 is not available. SO_2 emissions from construction activities, however, are expected to be insignificant.					

As shown in Table 10, construction operations would generate low-level emissions for CO, SO_2, NO_2, PM_{10}, and VOC, well below the PSD threshold of 250 tons per year. In addition, these emissions are expected to be reduced through frequent spraying of exposed soil during

construction. Combustive and fugitive dust emissions would have minimal localized short-term effects and would not result in long-term air quality impacts on Clark County.

3.2 Commuting to and From ISAFAF

Alternative C reduces the number of full-time personnel at ISAFAF by approximately 560. The resulting reduction in commuting emissions to and from the base would result in lower emissions than under existing conditions. The decrease in emissions from commuting vehicles under Alternative C is presented in Table 11.

Table 11. Emissions from Commuting Vehicles under Alternative C

Source	*POLLUTANTS (TONS PER YEAR)*				
	CO	***SO_2***	***NO_2***	***PM_{10}***	***VOC***
Commuting POVs	-87.4	-0.02	-7.1	-0.3	-12.0
Commuting Busses	-3.7	-0.02	-2.2	-0.3	-1.0
Total Emissions	**-91.1**	**-0.04**	**-9.2**	**-0.7**	**-12.9**

3.3 Aircraft Operations

Alternative C emissions from aircraft operations were calculated based on the same emission data and assumptions presented under Alternative A. The beddown of eight additional Predator UAV would result in an increase of 256 sorties per year at ISAFAF. A summary of emissions from proposed aircraft operations under Alternative C is presented in Table 12.

Table 12. Emissions from Aircraft Operations under Alternative C

Source	*POLLUTANTS (TONS PER YEAR)*				
	CO	***SO_2***	***NO_2***	***PM_{10}***	***VOC***
BASELINE					
LTO and TGOs (ISAFAF)	56.1	0.01	0.1	0.05	0.8
NTTR	160.1	0.02	0.6	0.2	2.0
R-2508	22.9	0.003	0.1	0.02	0.3
ALTERNATIVE C					
LTO and TGOs (ISAFAF)	41.0	0.1	1.0	0.2	1.1
NTTR	113.0	0.3	3.9	0.6	1.4
R-2508	16.2	0.04	0.6	0.1	0.2
INCREASE FROM BASELINE					
LTO and TGOs (ISAFAF)	-15.1	0.1	0.9	0.1	0.3
NTTR	-47.1	0.3	3.2	0.4	-0.6
R-2508	-6.7	0.04	0.5	0.1	-0.1

As shown in Table 12, LTO and TGOs aircraft operations at ISAFAF would generate very low emissions of SO_2, NO_2, PM_{10}, and VOC. Emissions of CO would decrease with the implementation of this alternative due to the different type of Predator UAVs (MQ-1 and RQ-1 vs. MQ-9) used compared to the baseline. These emissions would not result in long-term impacts on the air quality of Clark County. Emissions from transit and mission operations in the NTTR and R-2508 airspace would not affect ground level air quality, since they would occur at a very high altitude (above the mean maximum mixing height for those areas) and would spread out over large areas.

3.4 Ground Support Equipment (GSE)

Emissions from GSE from Alternative C were calculated based on emission data and assumptions presented for Alternative A. The beddown of additional Predator UAV would result in emissions from GSE presented in Table 13. This additional equipment would generate very low emissions for all categories and would not result in long-term consequences to air quality in Clark County.

Table 13. Emissions from Ground Support Equipment under Alternative C

Source	*POLLUTANTS (TONS PER YEAR)*				
	CO	***SO_2***	***NO_2***	***PM_{10}***	***VOC***
Ground Support Equipment	0.7	0.2	3.4	0.2	0.3

3.5 Total Annual Operational Emissions Under Alternative C

Total annual operational emission increases resulting from the implementation of Alternative C at ISAFAF are presented in Table 14. The implementation of this alternative would result in a decrease of emissions of CO, NO_2, PM_{10} and VOC compared to baseline, and insignificant emissions of SO_2. These emissions, therefore, would not result in significant long-term impacts on Clark County air quality.

Table 14. Total Annual Operational Emission Changes under Alternative C

Source	*POLLUTANTS (TONS PER YEAR)*				
	CO	***SO_2***	***NO_2***	***PM_{10}***	***VOC***
Commuter Vehicles	-91.1	-0.04	-9.2	-0.7	-12.9
Aircraft Operations (ISAFAF)	-15.1	0.1	0.9	0.1	0.3
Ground Support Equipment	0.7	0.2	3.4	0.2	0.3
Total Emissions (ISAFAF)	**-105.5**	**0.3**	**-4.9**	**-0.3**	**-12.3**

4.0 NO ACTION ALTERNATIVE

Under the No Action Alternative, no additional Predator UAV would be added at ISAFAF. Therefore, no construction emissions and no emissions increase or decrease from the operational emissions associated with the current activities would result from this alternative.

Predator EA - Emission Calculations
Bldg Const- Alt A,B&C (ISAFAF)

Emission Factors

Land Use	Unit of Measure	mission Factors (lbs/construction perio			
		ROC	NOx	CO	PM10
General Industrial	1000 ft2 GFA	32.79	481.88	104.79	34.22

Construction Data

Fiscal Year	*Alternatives A and B* *Increased Area*		*Alternative C* *Increased Area*	
FY03	178060	sq ft		
FY04	123500	sq ft		
FY05	126000	sq ft		sq ft
FY06	189730	sq ft	84,000	sq ft
Total	**617290**	sq ft	**84000**	sq ft

Annual Emissions (Alternatives A and B)

Fiscal Year	Emissions (lbs/year)			
	ROC	NOx	CO	PM10
FY03	5838.6	85803.6	18658.9	6093.2
FY04	4049.6	59512.2	12941.6	4226.2
FY05	4131.5	60716.9	13203.5	4311.7
FY06	6221.2	91427.1	19881.8	6492.6

Fiscal Year	Emissions (tons/year)			
	ROC	NOx	CO	PM10
FY03	2.9	42.9	9.3	3.0
FY04	2.0	29.8	6.5	2.1
FY05	2.1	30.4	6.6	2.2
FY06	3.1	45.7	9.9	3.2

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
9.3		42.9	3.0	2.9
6.5		29.8	2.1	2.0
6.6		30.4	2.2	2.1
9.9		45.7	3.2	3.1

Annual Emissions (Alternative C)

Fiscal Year	Emissions (lbs/year)			
	ROC	NOx	CO	PM10
FY03	0.0	0.0	0.0	0.0
FY04	0.0	0.0	0.0	0.0
FY05	0.0	0.0	0.0	0.0
FY06	2754.4	40477.9	8802.4	2874.5

Fiscal Year	Emissions (tons/year)			
	ROC	NOx	CO	PM10
FY03	0.0	0.0	0.0	0.0
FY04	0.0	0.0	0.0	0.0
FY05	0.0	0.0	0.0	0.0
FY06	1.4	20.2	4.4	1.4

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
0.0		0.0	0.0	0.0
0.0		0.0	0.0	0.0
0.0		0.0	0.0	0.0
4.4		20.2	1.4	1.4

Predator EA - Emission Calculations
Grading (ISAFAF)

Emissions from Grading

		Alternative		
		A	B	C
Grading	Square Feet			
New facilities & structures		617,290	617,290	84,000
Pavement		220,000	220,000	220,000
TOTAL GRADED AREA	**Square Feet**	**4,000,000**	**4,000,000**	**1,452,304**
TOTAL GRADED AREA	**Acres**	**91.83**	**91.83**	**33.34**

Grading Emission Factor 55 lb/acre/day

Number of days of ground disturbance from grading per acre 3

Emissions PM10 (lb/day)	15152	15152	5501
Emissions PM10 (tons/day)	7.6	7.6	2.8

Acres/day 3
Days of grading 31

	Alternative		
	A	B	C
PM10 Emissions (tons)	231.9	231.9	84.2
PM10 Emissions (tons/year)	58.0	58.0	28.1

From: Table 2-4. Proposed Beddown Projects

		Alternatives A and B		*Alternative C*	
		Increased Area (sq ft)	*Timing*	*Increased Area (sq ft)*	*Timing*
	Munitions Storage Structures				
	[3 at Nellis AFB)	7,200	FY06		

Grand Total	7,200 sq ft	0 sq ft
FY03	0 sq ft	0 sq ft
FY04	0 sq ft	0 sq ft
FY05	0 sq ft	0 sq ft
FY06	7200 sq ft	0 sq ft

Emission Factors

Land Use	Unit of Measure	ssion Factors (lbs/construction peri			
		ROC	NOx	CO	PM10
General Industrial	1000 ft2 GFA	32.79	481.88	104.79	34.22

Construction Data

Fiscal Year	*Alternatives A and B* *Increased Area*		*Alternative C* *Increased Area*	
FY04	0	sq ft	0	sq ft
FY05	0	sq ft	0	sq ft
FY06	7200	sq ft	0	sq ft

Annual Emissions (Alternatives A and B)

Fiscal Year	Emissions (lbs/year)			
	ROC	NOx	CO	PM10
FY04	0.0	0.0	0.0	0.0
FY05	0.0	0.0	0.0	0.0
FY06	236.1	3469.5	754.5	246.4

Fiscal Year	Emissions (tons/year)			
	ROC	NOx	CO	PM10
FY04	0.0	0.0	0.0	0.0
FY05	0.0	0.0	0.0	0.0
FY06	0.1	1.7	0.4	0.1

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
0.0		0.0	0.0	0.0
0.0		0.0	0.0	0.0
0.4		1.7	0.1	0.1

Annual Emissions (Alternative C)

Fiscal Year	Emissions (lbs/year)			
	ROC	NOx	CO	PM10
FY04	0.0	0.0	0.0	0.0
FY05	0.0	0.0	0.0	0.0
FY06	0.0	0.0	0.0	0.0

Fiscal Year	Emissions (tons/year)			
	ROC	NOx	CO	PM10
FY04	0.0	0.0	0.0	0.0
FY05	0.0	0.0	0.0	0.0
FY06	0.0	0.0	0.0	0.0

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
0.0		0.0	0.0	0.0
0.0		0.0	0.0	0.0
0.0		0.0	0.0	0.0

Emissions from Grading

		Alternative		
		A	B	C
Grading	Square Feet			
New facilities		7,200	7,200	0
New Pavement				
TOTAL GRADED AREA	**Square Feet**	**34,397**	**34,397**	**0**
TOTAL GRADED AREA	**Acres**	**0.79**	**0.79**	**0.00**

Grading Emission Factor 55 lb/acre/day

Number of days of ground disturbance from grading per acre 3

Emissions PM10 (lb/day)	130	130	0
Emissions PM10 (tons/day)	0.1	0.1	0.0

Acres/day 3
Days of grading 0.3

	Alternative		
	A	B	C
Emissions (tons/year)	0.017	0.017	0.000

Predator EA - Emission Calculations

ISAFAF Commuting(POV)-Alt A

POV Emission Factors (High Altitude > 4,000 feet)

(from Jagelski & O'Brien, 1994)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
POV	1990	33.850	4.080	2.160	0.005	0.082
POV	1995	20.600	2.820	1.670	0.005	0.078

(Low Altitude <= 4,000 feet)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
POV	1990	24.520	3.410	2.300	0.005	0.082
POV	1995	16.580	2.470	1.640	0.005	0.078

POV Commuting Data

Commuting Distance =	**90**	**miles/RT**
Weekly schedule =	**5**	**days/week**
Annual schedule =	**48**	**weeks/year**
AVR =	**1.1**	**commuters/RT**
% of Employees Living On-Base	**-**	**%**

AVR=Average vehicle ridership

Assume on-base workers do not commute.

Commuters	Total	Fraction using POVs
Baseline		
Proposed	**101**	**0.25**

Average model year (baseline) = **1995**

Average model year (proposed) = **1995**

#RT/day = #empl/day*(%commuters/100)/AVR

#miles/yr = #miles/RT * RT/wk * wk/yr

Emission Calculation

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons)	VOC (tons)	NOx (tons)	SOx (tons)	PM (tons)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	25	23	495,818	11.3	1.5	0.9	0.0	0.0

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
11.3	0.0	0.9	0.0	1.5

Predator EA - Emission Calculations

ISAFAF Commuting(POV)-Alt B

POV Emission Factors (High Altitude > 4,000 feet)

(from Jagelski & O'Brien, 1994)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
POV	1990	33.850	4.080	2.160	0.005	0.082
POV	1995	20.600	2.820	1.670	0.005	0.078

(Low Altitude <= 4,000 feet)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
POV	1990	24.520	3.410	2.300	0.005	0.082
POV	1995	16.580	2.470	1.640	0.005	0.078

POV Commuting Data

Commuting Distance =	**90**	**miles/RT**
Weekly schedule =	**5**	**days/week**
Annual schedule =	**48**	**weeks/year**
AVR =	**1.1**	**commuters/RT**
% of Employees Living On-Base	**-**	**%**

AVR=Average vehicle ridership

Assume on-base workers do not commute.

Commuters	Total	Fraction using POVs
Baseline		
Proposed	**143**	**0.25**

Average model year (baseline) = **1995**

Average model year (proposed) = **1995**

#RT/day = #empl/day*(%commuters/100)/AVR

#miles/yr = #miles/RT * RT/wk * wk/yr

Emission Calculation

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons)	VOC (tons)	NOx (tons)	SOx (tons)	PM (tons)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	36	33	702,000	15.9	2.2	1.3	0.0	0.1

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
15.9	0.0	1.3	0.1	2.2

Predator EA - Emission Calculations

ISAFAF Commuting(POV)-Alt C

POV Emission Factors

(from Jagelski & O'Brien, 1994)

(High Altitude > 4,000 feet)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
POV	1990	33.850	4.080	2.160	0.005	0.082
POV	1995	20.600	2.820	1.670	0.005	0.078

(Low Altitude <= 4,000 feet)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
POV	1990	24.520	3.410	2.300	0.005	0.082
POV	1995	16.580	2.470	1.640	0.005	0.078

POV Commuting Data

Commuting Distance =	**90**	**miles/RT**
Weekly schedule =	**5**	**days/week**
Annual schedule =	**48**	**weeks/year**
AVR =	**1.1**	**commuters/RT**
% of Employees Living On-Base	**-**	**%**

AVR=Average vehicle ridership

Assume on-base workers do not commute.

Commuters	Total	Fraction using POVs
Baseline		
Proposed	**(560)**	**0.25**

Average model year (baseline) = **1995**

Average model year (proposed) = **1995**

#RT/day = #empl/day*(%commuters/100)/AVR

#miles/yr = #miles/RT * RT/wk * wk/yr

Emission Calculation

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons)	VOC (tons)	NOx (tons)	SOx (tons)	PM (tons)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	(140)	(127)	(2,749,091)	-62.4	-8.5	-5.1	0.0	-0.2

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
-62.4	0.0	-5.1	-0.2	-8.5

Predator EA - Emission Calculations

ISAFAF Commuting(POV2Bus)-Alt A

POV Emission Factors (High Altitude > 4,000 feet)

(from Jagelski & O'Brien, 1994)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
POV	1990	33.850	4.080	2.160	0.005	0.082
POV	1995	20.600	2.820	1.670	0.005	0.078

(Low Altitude <= 4,000 feet)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
POV	1990	24.520	3.410	2.300	0.005	0.082
POV	1995	16.580	2.470	1.640	0.005	0.078

POV Commuting Data

Commuting Distance =	**12**	**miles/RT**
Weekly schedule =	**5**	**days/week**
Annual schedule =	**48**	**weeks/year**
AVR =	**1.1**	**commuters/RT**
% of Employees Living On-Base	**-**	**%**

AVR=Average vehicle ridership

Assume on-base workers do not commute.

Commuters	Total	Fraction using POVs
Baseline		
Proposed	**101**	**0.75**

Average model year (baseline) = **1995**

Average model year (proposed) = **1995**

#RT/day = #empl/day*(%commuters/100)/AVR

#miles/yr = #miles/RT * RT/wk * wk/yr

Emission Calculation

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons)	VOC (tons)	NOx (tons)	SOx (tons)	PM (tons)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	76	69	198,327	4.5	0.6	0.4	0.0	0.0

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
4.5	0.0	0.4	0.0	0.6

Predator EA - Emission Calculations

ISAFAF Commuting(POV2Bus)-Alt B

POV Emission Factors (High Altitude > 4,000 feet)

(from Jagelski & O'Brien, 1994)

		Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
	POV	1990	33.850	4.080	2.160	0.005	0.082
	POV	1995	20.600	2.820	1.670	0.005	0.078

(Low Altitude <= 4,000 feet)

		Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
	POV	1990	24.520	3.410	2.300	0.005	0.082
	POV	1995	16.580	2.470	1.640	0.005	0.078

POV Commuting Data

Commuting Distance =	**12**	**miles/RT**	
Weekly schedule =	**5**	**days/week**	
Annual schedule =	**48**	**weeks/year**	
AVR =	**1.1**	**commuters/RT**	**AVR=Average vehicle ridership**
% of Employees Living On-Base	**-**	**%**	**Assume on-base workers do not commute.**

Commuters	Total	Fraction using POVs
Baseline		
Proposed	**143**	**0.75**

Average model year (baseline) = **1995**

Average model year (proposed) = **1995**

#RT/day = #empl/day*(%commuters/100)/AVR

#miles/yr = #miles/RT * RT/wk * wk/yr

Emission Calculation

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons)	VOC (tons)	NOx (tons)	SOx (tons)	PM (tons)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	107	98	280,800	6.4	0.9	0.5	0.0	0.0

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
6.4	0.0	0.5	0.0	0.9

Predator EA - Emission Calculations

ISAFAF Commuting(POV2Bus)-Alt C

POV Emission Factors (High Altitude > 4,000 feet)

(from Jagelski & O'Brien, 1994)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
POV	1990	33.850	4.080	2.160	0.005	0.082
POV	1995	20.600	2.820	1.670	0.005	0.078

(Low Altitude <= 4,000 feet)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
POV	1990	24.520	3.410	2.300	0.005	0.082
POV	1995	16.580	2.470	1.640	0.005	0.078

POV Commuting Data

Commuting Distance =	**12**	**miles/RT**
Weekly schedule =	**5**	**days/week**
Annual schedule =	**48**	**weeks/year**
AVR =	**1.1**	**commuters/RT**
% of Employees Living On-Base	**-**	**%**

AVR=Average vehicle ridership

Assume on-base workers do not commute.

Commuters	Total	Fraction using POVs
Baseline		
Proposed	**(560)**	**0.75**

Average model year (baseline) = **1995**

Average model year (proposed) = **1995**

#RT/day = #empl/day*(%commuters/100)/AVR

#miles/yr = #miles/RT * RT/wk * wk/yr

Emission Calculation

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons)	VOC (tons)	NOx (tons)	SOx (tons)	PM (tons)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	(420)	(382)	(1,099,636)	-25.0	-3.4	-2.0	0.0	-0.1

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
-25.0	0.0	-2.0	-0.1	-3.4

Predator EA - Emission Calculations

ISAFAF Commuting(Bus)-Alt A

POV Emission Factors (High Altitude > 4,000 feet)

(from Jagelski & O'Brien, 1994)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
HDDV	1990	20.260	5.600	18.530	0.088	1.652
HDDV	1995	18.690	4.910	10.810	0.088	1.652

(Low Altitude <= 4,000 feet)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
HDDV	1990	12.290	2.510	18.530	0.088	1.652
HDDV	1995	11.220	2.160	10.810	0.088	1.652

POV Commuting Data

Commuting Distance = **90** **miles/RT**

Weekly schedule = **5** **days/week**

Annual schedule = **48** **weeks/year**

AVR = **50** **commuters/RT** **AVR=Average vehicle ridership**

% of Employees Living On-Base **-** **%** **Assume on-base workers do not commute.**

Commuters	Total	Fraction using POVs
Baseline		
Proposed	**101**	**0.75**

Average model year (baseline) = **1995**

Average model year (proposed) = **1995**

#RT/day = #empl/day*(%commuters/100)/AVR

#miles/yr = #miles/RT * RT/wk * wk/yr

Emission Calculation

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons/yr)	VOC (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM (tons/yr)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	76	2	32,724	0.7	0.2	0.4	0.0	0.1

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
0.7	0.0	0.4	0.1	0.2

Predator EA - Emission Calculations

ISAFAF Commuting(Bus)-Alt B

POV Emission Factors (High Altitude > 4,000 feet)

(from Jagelski & O'Brien, 1994)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
HDDV	1990	20.260	5.600	18.530	0.088	1.652
HDDV	1995	18.690	4.910	10.810	0.088	1.652

(Low Altitude <= 4,000 feet)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
HDDV	1990	12.290	2.510	18.530	0.088	1.652
HDDV	1995	11.220	2.160	10.810	0.088	1.652

POV Commuting Data

Commuting Distance = **90** **miles/RT**

Weekly schedule = **5** **days/week**

Annual schedule = **48** **weeks/year**

AVR = **50** **commuters/RT** **AVR=Average vehicle ridership**

% of Employees Living On-Base **-** **%** **Assume on-base workers do not commute.**

Commuters	Total	Fraction using POVs
Baseline		
Proposed	**143**	**0.75**

Average model year (baseline) = **1995**

Average model year (proposed) = **1995**

#RT/day = #empl/day*(%commuters/100)/AVR

#miles/yr = #miles/RT * RT/wk * wk/yr

Emission Calculation

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons/yr)	VOC (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM (tons/yr)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	107	2	46,332	1.0	0.3	0.6	0.0	0.1

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
1.0	0.0	0.6	0.1	0.3

Predator EA - Emission Calculations

ISAFAF Commuting(Bus)-Alt C

POV Emission Factors (High Altitude > 4,000 feet)

(from Jagelski & O'Brien, 1994)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
HDDV	1990	20.260	5.600	18.530	0.088	1.652
HDDV	1995	18.690	4.910	10.810	0.088	1.652

(Low Altitude <= 4,000 feet)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
HDDV	1990	12.290	2.510	18.530	0.088	1.652
HDDV	1995	11.220	2.160	10.810	0.088	1.652

POV Commuting Data

Commuting Distance =	**90**	**miles/RT**
Weekly schedule =	**5**	**days/week**
Annual schedule =	**48**	**weeks/year**
AVR =	**50**	**commuters/RT**
% of Employees Living On-Base	**-**	**%**

AVR=Average vehicle ridership

Assume on-base workers do not commute.

Commuters	Total	Fraction using POVs
Baseline		
Proposed	**(560)**	**0.75**

Average model year (baseline) = **1995**

Average model year (proposed) = **1995**

#RT/day = #empl/day*(%commuters/100)/AVR

#miles/yr = #miles/RT * RT/wk * wk/yr

Emission Calculation

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons/yr)	VOC (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM (tons/yr)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	(420)	(8)	(181,440)	-3.7	-1.0	-2.2	0.0	-0.3

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
-3.7	0.0	-2.2	-0.3	-1.0

Emission Factors- Predator

						Aircraft Emissions - Sorties (Intermediate Mode)					
	Similar		No.	Engine	EF	(lb/hr)					
Aircraft	Aircraft	Engine	Eng.	Reference	Reference	Fuel	CO	VOC	NOx	SOx	PM
RQ-1	RQ-1	0-320	1	Similar engine to Rodax 914	EPA (1992), p. 162	66.60	65.90	0.82	0.26	0.01	0.07
MQ-1	MQ-1	0-320	1	Similar engine to Rodax 914	EPA (1992), p. 162	66.60	65.90	0.82	0.26	0.01	0.07
MQ-9	MQ-9	PT6A-27	1	Small turboprop engine	EPA (1992), p. 167	400.20	0.48	0.00	2.80	0.22	0.40

Aircraft Emissions - LTOs					
(lb/LTO)					
Fuel	CO	VOC	NOx	SOx	PM
15.35	17.21	0.28	0.02	0.00	0.02
15.35	17.21	0.28	0.02	0.00	0.02
91.00	2.50	1.59	0.56	0.05	0.09

Aircraft Emissions - TGOs					
(lb/TGO)					
Fuel	CO	VOC	NOx	SOx	PM
12.79	14.46	0.19	0.02	0.00	0.01
12.79	14.46	0.19	0.02	0.00	0.01
60.28	0.53	0.05	0.48	0.03	0.06

Notes:

Lycoming O-320 engine is used on Piper PA-18 aircraft (small prop)

DeHaviland PT-6A-27 engine is used on the UV-18A aircraft (small turbo-prop)

Intermediate Mode = 80% power

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Calculations are based on sorties

One Sortie includes:
* One LTO at ISAFAF
* Five TGO's at ISAFAF
* Flight time to restricted airspace (not included).
* Flight time in restricted airspace.

Restricted Airspace	Flight time (hrs)
R-4806W (Indian Springs)	4.5
R-2805 (Edwards)	4

Data from Table 2-1

	Aircraft Mix			
Aircraft	**Existing**	**Alt A**	**Alt B**	**Alt C**
RQ-1/MQ-1	40	68	68	28
MQ-9	0	8	20	20
Total	**40**	**76**	**88**	**48**

	Aircraft Percentages			
Aircraft	**Existing**	**Alt A**	**Alt B**	**Alt C**
RQ-1/MQ-1	100%	89%	77%	58%
MQ-9	0%	11%	23%	42%
Total	**100%**	**100%**	**100%**	**100%**

Data from Table 2-4:

	Sorties to Restricted Airspaces			
Restricted Airspace	**Existing**	**Alt A**	**Alt B**	**Alt C**
R-4806W (Indian Springs)	1080	2,988	3,720	1,300
R-2508 (Edwards)	174	960	960	210
Total Sorties	**1254**	**3948**	**4680**	**1510**

Difference from Existing Conditions:

Restricted Airspace		**Alt A**	**Alt B**	**Alt C**
R-4806W (Indian Springs)		1,908	2,640	220
R-2508 (Edwards)		786	786	36
Total Sorties	**0**	**2694**	**3426**	**256**

Emission Factors for RQ-1/MQ-1:

Operation	CO	VOC	NOx	SOx	PM
LTO (lb/LTO)	17.21	0.28	0.02	0.00	0.02
TGO (lb/TGO)	14.46	0.19	0.02	0.00	0.01
Intermediate Power (lb/hr)	65.90	0.82	0.26	0.01	0.07

Sorties (all aircraft types):

	Sorties to Restricted Airspaces			
Restricted Airspace	**Existing**	**Alt A**	**Alt B**	**Alt C**
R-4806W (Indian Springs)	1080	2,988	3,720	1,300
R-2508 (Edwards)	174	960	960	210
Total Sorties	**1254**	**3948**	**4680**	**1510**

LTO
E=(Total Sorties)*(LTO/sortie)*(EF,LTO)*(%Aircraft)/2000
TGO
E=(Total Sorties)*(TGO/sortie)*(EF,TGO)*(%Aircraft)/2000
RA Activities
E=(Sorties/RA)*(Time,hr)*(EF,IntPwr)*(%Aircraft)/2000

	Percentage of Aircraft Type			
Aircraft Type	**Existing**	**Alt A**	**Alt B**	**Alt C**
RQ-1/MQ-1	100%	89%	77%	58%

Sortie Components		
LTO (# per sortie)	1	
TGO (# per sortie)	5	
Time in Restricted Airspace	4.5	R-4806W (Indian Springs)
Time in Restricted Airspace	4	R-2508 (Edwards)

Existing Operations	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	10.8	0.2	0.0	0.0	0.0
TGO	45.3	0.6	0.1	0.0	0.0
R-4806W (Indian Springs)	160.1	2.0	0.6	0.0	0.2
R-2508 (Edwards)	22.9	0.3	0.1	0.0	0.0

Existing Operations	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAF	56.1	0.0	0.1	0.0	0.8
R-4806W	160.1	0.0	0.6	0.2	2.0
R-2508	22.9	0.0	0.1	0.0	0.3

Alternative A	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	30.4	0.5	0.0	0.0	0.0
TGO	127.7	1.6	0.2	0.0	0.1
R-4806W (Indian Springs)	396.4	5.0	1.6	0.0	0.4
R-2508 (Edwards)	113.2	1.4	0.5	0.0	0.1

Alternative A	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAF	158.1	0.0	0.2	0.1	2.1
R-4806W	396.4	0.0	1.6	0.4	5.0
R-2508	113.2	0.0	0.5	0.1	1.4

Alternative A	Increased Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAF	101.9	0.0	0.2	0.1	1.4
R-4806W	236.3	0.0	0.9	0.2	3.0
R-2508	90.3	0.0	0.4	0.1	1.1

Alternative B	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	31.1	0.5	0.0	0.0	0.0
TGO	130.7	1.7	0.2	0.0	0.1
R-4806W (Indian Springs)	426.2	5.3	1.7	0.0	0.4
R-2508 (Edwards)	97.8	1.2	0.4	0.0	0.1

Alternative B	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAF	161.8	0.0	0.2	0.1	2.2
R-4806W	426.2	0.0	1.7	0.4	5.3
R-2508	97.8	0.0	0.4	0.1	1.2

Alternative B	Increased Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAF	105.7	0.0	0.2	0.1	1.4
R-4806W	266.1	0.0	1.1	0.3	3.3
R-2508	74.8	0.0	0.3	0.1	0.9

Alternative C	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	7.6	0.1	0.0	0.0	0.0
TGO	31.8	0.4	0.0	0.0	0.0
R-4806W (Indian Springs)	112.4	1.4	0.5	0.0	0.1
R-2508 (Edwards)	16.1	0.2	0.1	0.0	0.0

Alternative C	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAF	39.4	0.0	0.1	0.0	0.5
R-4806W	112.4	0.0	0.5	0.1	1.4
R-2508	16.1	0.0	0.1	0.0	0.2

Alternative C	Increased Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAF	-16.7	0.0	0.0	0.0	-0.2
R-4806W	-47.7	0.0	-0.2	0.0	-0.6
R-2508	-6.8	0.0	0.0	0.0	-0.1

Emission Factors for MQ-9

Operation	CO	VOC	NOx	SOx	PM
LTO (lb/LTO)	2.50	1.59	0.56	0.05	0.09
TGO (lb/TGO)	0.53	0.05	0.48	0.03	0.06
Intermediate Power (lb/hr)	0.48	0.00	2.80	0.22	0.40

Sorties (all aircraft types):	Sorties to Restricted Airspaces			
Restricted Airspace	**Existing**	**Alt A**	**Alt B**	**Alt C**
R-4806W (Indian Springs)	1080	2,988	3,720	1,300
R-2508 (Edwards)	174	960	960	210
Total Sorties	**1254**	**3948**	**4680**	**1510**

LTO
E=(Total Sorties)*(LTO/sortie)*(EF,LTO)*(%Aircraft)/2000
TGO
E=(Total Sorties)*(TGO/sortie)*(EF,TGO)*(%Aircraft)/2000
RA Activities
E=(Sorties/RA)*(Time,hr)*(EF,IntPwr)*(%Aircraft)/2000

	Percentage of Aircraft Type			
Aircraft Type	**Existing**	**Alt A**	**Alt B**	**Alt C**
MQ-9	0%	11%	23%	42%

Sortie Components		
LTO (# per sortie)	1	
TGO (# per sortie)	5	
Time in Restricted Airspace	4.5	R-4806W (Indian Springs)
Time in Restricted Airspace	4	R-2508 (Edwards)

Existing Operations	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	0.0	0.0	0.0	0.0	0.0
TGO	0.0	0.0	0.0	0.0	0.0
R-4806W (Indian Springs)	0.0	0.0	0.0	0.0	0.0
R-2508 (Edwards)	0.0	0.0	0.0	0.0	0.0

Existing Operations	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAF	0.0	0.0	0.0	0.0	0.0
R-4806W	0.0	0.0	0.0	0.0	0.0
R-2508	0.0	0.0	0.0	0.0	0.0

Alternative A	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	0.5	0.3	0.1	0.0	0.0
TGO	0.6	0.0	0.5	0.0	0.1
R-4806W (Indian Springs)	0.3	0.0	2.0	0.2	0.3
R-2508 (Edwards)	0.1	0.0	0.6	0.0	0.1

Alternative A	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAF	1.1	0.0	0.6	0.1	0.4
R-4806W	0.3	0.2	2.0	0.3	0.0
R-2508	0.1	0.0	0.6	0.1	0.0

Alternative A	Increased Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
	1.1	0.0	0.6	0.1	0.4
	0.3	0.2	2.0	0.3	0.0
	0.1	0.0	0.6	0.1	0.0

Alternative B	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	1.3	0.8	0.3	0.0	0.0
TGO	1.4	0.1	1.3	0.1	0.2
R-4806W (Indian Springs)	0.9	0.0	5.3	0.4	0.8
R-2508 (Edwards)	0.2	0.0	1.2	0.1	0.2

Alternative B	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAF	2.7	0.1	1.6	0.2	1.0
R-4806W	0.9	0.4	5.3	0.8	0.0
R-2508	0.2	0.1	1.2	0.2	0.0

Alternative B	Increased Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
	2.7	0.1	1.6	0.2	1.0
	0.9	0.4	5.3	0.8	0.0
	0.2	0.1	1.2	0.2	0.0

Alternative C	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	0.8	0.5	0.2	0.0	0.0
TGO	0.8	0.1	0.8	0.1	0.1
R-4806W (Indian Springs)	0.6	0.0	3.4	0.3	0.5
R-2508 (Edwards)	0.1	0.0	0.5	0.0	0.1

Alternative C	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAF	1.6	0.1	0.9	0.1	0.6
R-4806W	0.6	0.3	3.4	0.5	0.0
R-2508	0.1	0.0	0.5	0.1	0.0

Alternative C	Increased Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
	1.6	0.1	0.9	0.1	0.6
	0.6	0.3	3.4	0.5	0.0
	0.1	0.0	0.5	0.1	0.0

Existing Operations	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	10.8	0.2	0.0	0.0	0.0
TGO	45.3	0.6	0.1	0.0	0.0
R-4806W (Indian Springs)	160.1	2.0	0.6	0.0	0.2
R-2508 (Edwards)	22.9	0.3	0.1	0.0	0.0

	Existing Operations				
	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAF	56.1	0.01	0.1	0.05	0.8
R-4806W	160.1	0.02	0.6	0.2	2.0
R-2508	22.9	0.003	0.1	0.02	0.3

Alternative A	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	30.9	0.8	0.2	0.0	0.0
TGO	128.2	1.7	0.7	0.0	0.2
R-4806W (Indian Springs)	396.8	5.0	3.6	0.2	0.7
R-2508 (Edwards)	113.3	1.4	1.0	0.1	0.2

	Alternative A				
	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAF	159.1	0.1	0.9	0.2	2.5
R-4806W	396.8	0.2	3.6	0.7	5.0
R-2508	113.3	0.1	1.0	0.2	1.4

Alternative A					
Increased Emissions (tons/year)					
CO	SOx	NOx	PM	VOC	
103.0	0.1	0.8	0.2	1.8	
236.6	0.2	2.9	0.5	3.0	
90.4	0.1	0.9	0.2	1.1	

Alternative B	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	32.5	1.4	0.3	0.0	0.1
TGO	132.1	1.8	1.5	0.1	0.3
R-4806W (Indian Springs)	427.1	5.3	7.0	0.5	1.2
R-2508 (Edwards)	98.0	1.2	1.6	0.1	0.3

	Alternative B				
	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAF	164.6	0.1	1.8	0.4	3.2
R-4806W	427.1	0.5	7.0	1.2	5.3
R-2508	98.0	0.1	1.6	0.3	1.2

Alternative B					
Increased Emissions (tons/year)					
CO	SOx	NOx	PM	VOC	
108.4	0.1	1.7	0.3	2.4	
267.0	0.4	6.4	1.0	3.3	
75.0	0.1	1.5	0.3	0.9	

Alternative C	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	8.4	0.6	0.2	0.0	0.0
TGO	32.7	0.5	0.8	0.1	0.1
R-4806W (Indian Springs)	113.0	1.4	3.9	0.3	0.6
R-2508 (Edwards)	16.2	0.2	0.6	0.0	0.1

	Alternative C				
	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAF	41.0	0.1	1.0	0.2	1.1
R-4806W	113.0	0.3	3.9	0.6	1.4
R-2508	16.2	0.04	0.6	0.1	0.2

Alternative C					
Increased Emissions (tons/year)					
CO	SOx	NOx	PM	VOC	
-15.1	0.1	0.9	0.1	0.3	
-47.1	0.3	3.2	0.4	-0.6	
-6.7	0.04	0.5	0.1	-0.1	

GSE Emissions

Alternative A

2694 sorties/year

Generator Time = 8 (hrs/sortie)
Generator Size = 40 (kW)

Pollutant	Emissions per kW-hr (g/kW-hr)	No. of hrs/year	Total per Year (tons/year/generator)	No. of Generators	Total/year (tons/yr)
PM10	1.34	21552	1.27	2	2.5
SOx	1.25	21552	1.19	2	2.4
CO	4.06	21552	3.86	2	7.7
HC	1.5	21552	1.43	2	2.9
NOx	18.8	21552	17.86	2	35.7

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
7.7	2.4	35.7	2.5	2.9

Alternative B

3426 sorties/year

Generator Time = 8 (hrs/sortie)
Generator Size = 40 (kW)

Pollutant	Emissions per kW-hr (g/kW-hr)	No. of hrs/year	Total per Year (tons/year/generator)	No. of Generators	Total/year (tons/yr)
PM10	1.34	27408	1.62	2	3.2
SOx	1.25	27408	1.51	2	3.0
CO	4.06	27408	4.91	2	9.8
HC	1.5	27408	1.81	2	3.6
NOx	18.8	27408	22.72	2	45.4

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
9.8	3.0	45.4	3.2	3.6

Alternative C

256 sorties/year

Generator Time = 8 (hrs/sortie)
Generator Size = 40 (kW)

Pollutant	Emissions per kW-hr (g/kW-hr)	No. of hrs/year	Total per Year (tons/year/generator)	No. of Generators	Total/year (tons/yr)
PM10	1.34	2048	0.12	2	0.2
SOx	1.25	2048	0.11	2	0.2
CO	4.06	2048	0.37	2	0.7
HC	1.5	2048	0.14	2	0.3
NOx	18.8	2048	1.70	2	3.4

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
0.7	0.2	3.4	0.2	0.3

Predator EA - Emission Calculations

Emission Factors - Vehicles

Fleet Emission Factors

Jagielski, K. and O'Brien, J. 1994. *Calculations Methods for Criteria Air Pollution Emission Inventories* , USAF, Armstrong Laboratory, AL/OE-TR-1994-0049. Brooks AFB.

See below for sulfur calculations, which are based on %S in fuel, etc.

1990 Average model year.

High Altitude >4,000 ft.

Vehicle Type	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)	Reference (from Jagelski & O'Brien, 1994)	
POV	33.85	4.08	2.16	0.005	0.082	(from Jagelski & O'Brien, 1994)	privately-owned vehicles
LDGV	27.27	1.9	1.5	0.005	0.022	(from Jagelski & O'Brien, 1994)	light-duty gasoline-fueled vehicles designed to transport 12 people or fewer
LDGT	39.34	2.76	1.84	0.007	0.022	(from Jagelski & O'Brien, 1994)	light-duty gasoline-fueled trucks with GVW <= 8,500 lbs
HDGV	93.95	4.03	4.01	0.011	0.102	(from Jagelski & O'Brien, 1994)	heavy-duty gasoline-fueled vehicles with GVW >8,500 lbs
LDDV	2.07	0.78	1.45	0.038	0.2	(from Jagelski & O'Brien, 1994)	light-duty diesel-powered vehicles designed to transport 12 people or fewer
LDDT	3.25	1.03	1.53	0.053	0.26	(from Jagelski & O'Brien, 1994)	light-duty diesel-powered trucks with GVW <= 8,500 lbs
HDDV	20.26	5.6	18.53	0.088	1.652	(from Jagelski & O'Brien, 1994)	heavy-duty diesel-powered vehicles with GVW > 8,500 lbs

1995 Average model year.

High Altitude >4,000 ft.

Vehicle Type	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)	Reference (from Jagelski & O'Brien, 1994)	
POV	20.6	2.82	1.67	0.005	0.078	(from Jagelski & O'Brien, 1994)	privately-owned vehicles
LDGV	15.58	1.17	1.29	0.005	0.022	(from Jagelski & O'Brien, 1994)	light-duty gasoline-fueled vehicles designed to transport 12 people or fewer
LDGT	23.87	1.8	1.58	0.007	0.022	(from Jagelski & O'Brien, 1994)	light-duty gasoline-fueled trucks with GVW <= 8,500 lbs
HDGV	60.63	2.94	3.86	0.011	0.102	(from Jagelski & O'Brien, 1994)	heavy-duty gasoline-fueled vehicles with GVW >8,500 lbs
LDDV	1.52	0.5	1.12	0.038	0.2	(from Jagelski & O'Brien, 1994)	light-duty diesel-powered vehicles designed to transport 12 people or fewer
LDDT	2.61	0.73	1.21	0.053	0.26	(from Jagelski & O'Brien, 1994)	light-duty diesel-powered trucks with GVW <= 8,500 lbs
HDDV	18.69	4.91	10.81	0.088	1.652	(from Jagelski & O'Brien, 1994)	heavy-duty diesel-powered vehicles with GVW > 8,500 lbs

1990 Average model year.

Low Altitude <=4,000 ft.

Vehicle Type	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)	Reference (from Jagelski & O'Brien, 1994)	
POV	24.52	3.41	2.3	0.005	0.082	(from Jagelski & O'Brien, 1994)	privately-owned vehicles
LDGV	20.36	1.71	1.61	0.005	0.022	(from Jagelski & O'Brien, 1994)	light-duty gasoline-fueled vehicles designed to transport 12 people or fewer
LDGT	27.42	2.39	2.05	0.007	0.022	(from Jagelski & O'Brien, 1994)	light-duty gasoline-fueled trucks with GVW <= 8,500 lbs
HDGV	59.83	3.27	5.81	0.011	0.102	(from Jagelski & O'Brien, 1994)	heavy-duty gasoline-fueled vehicles with GVW >8,500 lbs
LDDV	1.56	0.6	1.45	0.038	0.2	(from Jagelski & O'Brien, 1994)	light-duty diesel-powered vehicles designed to transport 12 people or fewer
LDDT	1.67	0.72	1.55	0.053	0.26	(from Jagelski & O'Brien, 1994)	light-duty diesel-powered trucks with GVW <= 8,500 lbs
HDDV	12.29	2.51	18.53	0.088	1.652	(from Jagelski & O'Brien, 1994)	heavy-duty diesel-powered vehicles with GVW > 8,500 lbs

1995 Average model year.

Low Altitude <=4,000 ft.

Vehicle Type	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)	Reference (from Jagelski & O'Brien, 1994)	
POV	16.58	2.47	1.64	0.005	0.078	(from Jagelski & O'Brien, 1994)	privately-owned vehicles
LDGV	13.2	1.12	1.22	0.005	0.022	(from Jagelski & O'Brien, 1994)	light-duty gasoline-fueled vehicles designed to transport 12 people or fewer
LDGT	18.49	1.63	1.63	0.007	0.022	(from Jagelski & O'Brien, 1994)	light-duty gasoline-fueled trucks with GVW <= 8,500 lbs
HDGV	36.39	2.42	4.93	0.011	0.102	(from Jagelski & O'Brien, 1994)	heavy-duty gasoline-fueled vehicles with GVW >8,500 lbs
LDDV	1.4	0.47	1.12	0.038	0.2	(from Jagelski & O'Brien, 1994)	light-duty diesel-powered vehicles designed to transport 12 people or fewer
LDDT	1.52	0.6	1.21	0.053	0.26	(from Jagelski & O'Brien, 1994)	light-duty diesel-powered trucks with GVW <= 8,500 lbs
HDDV	11.22	2.16	10.81	0.088	1.652	(from Jagelski & O'Brien, 1994)	heavy-duty diesel-powered vehicles with GVW > 8,500 lbs

SOx Emission Factors

S = sulfur content of fuel (S)	ppm	%	Fuel	Ref
	80	0.008	Gasoline	http://www.chevron.com/prodserv/fuels/bulletin/phase2rfg/char.shtml
	500	0.05	Diesel	http://www.chevron.com/prodserv/fuels/bulletin/diesel/L2_3_9_rf.htm

Typical Fuel Economy (X)	MPG	Diesel		Gasol.		http://www1.faa.gov/arp/app600/ileav/Technical_Report.doc
Heavy Duty Trucks	6-8	6	HDDV	7.5	HDGV	
Medium Duty Trucks	10-14	10	LDDT	12.5	LDGT	
Light Duty Trucks/Cars	16-24	14	LDDV	17.5	LDGV	

Density of fuel (D)

Diesel	7	lb/gal
Gasoline	7	lb/gal

Emission Factor for SO2

EF (g/mi) = (1 gal fuel/X miles) * (D lb fuel/1 gal fuel) * (453.6 g/lb) * (S g sulfur/1,000,000 g fuel) * (64.06 g SO2/32.06 g S)

	SOx (g/mi)	
POV	0.0048	privately-owned vehicles
LDGV	0.0048	light-duty gasoline-fueled vehicles designed to transport 12 people or fewer
LDGT	0.0068	light-duty gasoline-fueled trucks with GVW <= 8,500 lbs
HDGV	0.0113	heavy-duty gasoline-fueled vehicles with GVW >8,500 lbs
LDDV	0.0378	light-duty diesel-powered vehicles designed to transport 12 people or fewer
LDDT	0.053	light-duty diesel-powered trucks with GVW <= 8,500 lbs
HDDV	0.0883	heavy-duty diesel-powered vehicles with GVW > 8,500 lbs

Predator EA - Emission Calculations

Emission Factors - Heavy Equip

Table A9-8-A

Emissions, lb = (# equip) * (hours/period) * (EF, lb/hr)

Table A9-8-B | Table A9-8-C | A9-8-D

Emissions = (# equip) * (hours/period) * (HP) * (EF, lb/HP-hr) * (load factor)

	Emission Factor (lb/HP-hour)								Emission Factor (lb/hour)				
Equipment	CO	ROC	NOx	SOx	PM10	HP	Gal	% Load	CO	ROC	NOx	SOx	PM10
Fork Lift, 50 HP - Gasoline									14	0.5	0.018	x	0.003
Fork Lift, 50 HP - Diesel									0.18	0.053	0.441	x	0.031
Fork Lift, 175 HP - Gasoline									43.97	1.53	0.92	x	0.123
Fork Lift, 175 HP - Diesel									0.52	0.17	1.54	x	0.093
Trucks, Off-Highway - Gasoline									x	x	x	x	x
Trucks, Off-Highway - Diesel									1.8	0.19	4.17	0.45	0.26
Tracked Loader - Gasoline									x	x	x	x	x
Tracked Loader - Diesel									0.201	0.095	0.83	0.076	0.059
Tracked Tractor - Gasoline									x	x	x	x	x
Tracked Tractor - Diesel									0.35	0.12	1.26	0.14	0.112
Scraper - Gasoline									x	x	x	x	x
Scraper - Diesel									1.25	0.27	3.84	0.46	0.41
Wheeled Dozer - Gasoline									x	x	x	x	x
Wheeled Dozer - Diesel									x	x	x	0.35	0.165
Wheeled Loader - Gasoline									15.57	0.515	0.518	0.023	0.03
Wheeled Loader - Diesel									0.572	0.23	1.9	0.182	0.17
Wheeled Tractor - Gasoline									9.53	0.351	0.43	0.015	0.024
Wheeled Tractor - Diesel									3.58	0.18	1.27	0.09	0.14
Roller - Gasoline									13.41	0.59	0.362	0.019	0.026
Roller - Diesel									0.3	0.065	0.87	0.067	0.05
Motor Grader - Gasoline									12.1	0.4	0.32	0.017	0.021
Motor Grader - Diesel									0.151	0.039	0.713	0.086	0.061
Miscellaneous - Gasoline									17.02	0.543	0.412	0.023	0.026
Miscellaneous - Diesel									0.675	0.15	1.7	0.143	0.14
Chainsaws > 4 HP (2-stroke) - Gasoline	2.150	0.684	0.002	0.001	0.001	6	2	50	6.450	2.052	0.006	0.002	0.004
Asphalt Paver - Diesel	0.007	0.001	0.023	0.002	0.001	91	46	59	0.376	0.054	1.235	0.107	0.054
Crane - Diesel	0.009	0.003	0.023	0.002	0.002	195	97	43	0.755	0.252	1.929	0.168	0.126
Concrete Paver -Diesel	0.010	0.002	0.022	0.002	0.001	130	66	62	0.806	0.161	1.773	0.161	0.081
Trctr/Lodr/Bckho - Diesel	0.015	0.003	0.022	0.002	0.001	79	21	46.5	0.551	0.110	0.808	0.073	0.037
Excavator - Diesel	0.011	0.001	0.024	0.002	0.001	152	95	58	0.968	0.088	2.112	0.176	0.088
Rubber Tired Dozers - Diesel	0.010	0.002	0.021	0.002	0.001	356	182	59	2.100	0.420	4.411	0.420	0.105
Bore/Drill Rig (4-strk) - Diesel	0.020	0.003	0.024	0.002	0.002	209	107	75	3.135	0.470	3.762	0.314	0.235
Fork Lifts - Diesel	0.013	0.003	0.031	0.002	0.002	83	42	30	0.324	0.075	0.772	0.050	0.037

Paving

	Alt A	Alt B	Alt C	
New Pavement (sq ft)	220,000	220,000	100,000	FY03
	70,000	70,000	70,000	FY05
			50,000	FY06

Dump Truck to Import Paving Materials (FY03)

Pavement depth (ft)	0.5	0.5	0.5	
Pavement volume (cu ft)	110000	110000	50000	
Pavement volume (cu yd)	12222	12222	5556	
Miles per round trip	90	90	90	Esitmate
Size of truckload	10	10	10	Typical size of dump truck
Total trips	1222	1222	556	(gravel volume) / (volume/truck)
Total miles	110000	110000	50000	(trips) x (miles/trip)

		Emission Factor (g/mi)				
Vehicle Type		**CO**	**VOC**	**NOx**	**SOx**	**PM**
HDDV		20.26	5.60	18.53	0.09	1.65

Pavement Hauling Emissions (FY03)		Emissions (tons/year)				
	Total Miles	**CO**	**VOC**	**NOx**	**SOx**	**PM**
Alternative A	110000	2.5	0.7	2.2	0.0	0.2
Alternative B	110000	2.5	0.7	2.2	0.0	0.2
Alternative C	50000	1.1	0.3	1.0	0.0	0.1

Installation of New Asphalt (FY03)

Paving Rate	5000	(sq ft/day)
Workday	8	(hr/day)

	Alt A	Alt B	Alt C
Days of paving activity	44	44	20
Hours of paving activity	352	352	160

		Emission Factor (lb/hour)				
Equipment		CO	ROC	NOx	SOx	PM10
Bulldozer		2.100	0.420	4.411	0.420	0.105
Asphalt Paver		0.376	0.054	1.235	0.107	0.054
Roller		0.300	0.065	0.870	0.067	0.050

Alternative A			Emissions (tons/year)				
Equipment	# Eq	Hours	CO	ROC	NOx	SOx	PM10
Bulldozer	1	352	0.4	0.1	0.8	0.1	0.0
Asphalt Paver	1	352	0.1	0.0	0.2	0.0	0.0
Roller	1	352	0.1	0.0	0.2	0.0	0.0

Alternative B			Emissions (tons/year)				
Equipment	# Eq	Hours	CO	ROC	NOx	SOx	PM10
Bulldozer	1	352	0.4	0.1	0.8	0.1	0.0
Asphalt Paver	1	352	0.1	0.0	0.2	0.0	0.0
Roller	1	352	0.1	0.0	0.2	0.0	0.0

Alternative C			Emissions (tons/year)				
Equipment	# Eq	Hours	CO	ROC	NOx	SOx	PM10
Bulldozer	1	160	0.2	0.0	0.4	0.0	0.0
Asphalt Paver	1	160	0.0	0.0	0.1	0.0	0.0
Roller	1	160	0.0	0.0	0.1	0.0	0.0

Total Emissions - Paving Operation (FY03)

	Emissions (tons/year)				
	CO	ROC	NOx	SOx	PM10
Alternative A	2.9	0.8	3.4	0.1	0.2
Alternative B	2.9	0.8	3.4	0.1	0.2
Alternative C	1.3	0.4	1.5	0.1	0.1

FY03 Emissions (tons/year)				
CO	**SOx**	**NOx**	**PM**	**VOC**
2.9	0.1	3.4	0.2	0.8
2.9	0.1	3.4	0.2	0.8
1.3	0.1	1.5	0.1	0.4

Dump Truck to Import Paving Materials (FY05)

Pavement depth (ft)	0.5	0.5	0.5	
Pavement volume (cu ft)	35000	35000	35000	
Pavement volume (cu yd)	3889	3889	3889	
Miles per round trip	90	90	90	Estimate
Size of truckload	10	10	10	Typical size of dump truck
Total trips	389	389	389	(gravel volume) / (volume/truck)
Total miles	35000	35000	35000	(trips) x (miles/trip)

Paving

		Emission Factor (g/mi)				
Vehicle Type		CO	VOC	NOx	SOx	PM
HDDV		20.26	5.60	18.53	0.09	1.65

Pavement Hauling Emissions (FY05)

		Emissions (tons/year)				
	Total Miles	CO	VOC	NOx	SOx	PM
Alternative A	35000	0.8	0.2	0.7	0.0	0.1
Alternative B	35000	0.8	0.2	0.7	0.0	0.1
Alternative C	35000	0.8	0.2	0.7	0.0	0.1

Installation of New Asphalt (FY05)

Paving Rate 5000 (sq ft/day)

Workday 8 (hr/day)

	Alt A	Alt B	Alt C
Days of paving activity	14	14	14
Hours of paving activity	112	112	112

		Emission Factor (lb/hour)				
Equipment		CO	ROC	NOx	SOx	PM10
Bulldozer		2.100	0.420	4.411	0.420	0.105
Asphalt Paver		0.376	0.054	1.235	0.107	0.054
Roller		0.300	0.065	0.870	0.067	0.050

Alternative A			Emissions (tons/year)				
Equipment	# Eq	Hours	CO	ROC	NOx	SOx	PM10
Bulldozer	1	112	0.1	0.0	0.2	0.0	0.0
Asphalt Paver	1	112	0.0	0.0	0.1	0.0	0.0
Roller	1	112	0.0	0.0	0.0	0.0	0.0

Alternative B			Emissions (tons/year)				
Equipment	# Eq	Hours	CO	ROC	NOx	SOx	PM10
Bulldozer	1	112	0.1	0.0	0.2	0.0	0.0
Asphalt Paver	1	112	0.0	0.0	0.1	0.0	0.0
Roller	1	112	0.0	0.0	0.0	0.0	0.0

Alternative C			Emissions (tons/year)				
Equipment	# Eq	Hours	CO	ROC	NOx	SOx	PM10
Bulldozer	1	112	0.1	0.0	0.2	0.0	0.0
Asphalt Paver	1	112	0.0	0.0	0.1	0.0	0.0
Roller	1	112	0.0	0.0	0.0	0.0	0.0

Total Emissions - Paving Operation (FY05)

	Emissions (tons/year)				
	CO	ROC	NOx	SOx	PM10
Alternative A	0.9	0.2	1.1	0.0	0.1
Alternative B	0.9	0.2	1.1	0.0	0.1
Alternative C	0.9	0.2	1.1	0.0	0.1

FY 05 Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
0.9	0.0	1.1	0.1	0.2
0.9	0.0	1.1	0.1	0.2
0.9	0.0	1.1	0.1	0.2

Dump Truck to Import Paving Materials (FY06)

Pavement depth (ft)	0.5	0.5	0.5	
Pavement volume (cu ft)	0	0	25000	
Pavement volume (cu yd)	0	0	2778	
Miles per round trip	90	90	90	Estimate
Size of truckload	10	10	10	Typical size of dump truck
Total trips	0	0	278	(gravel volume) / (volume/truck)
Total miles	0	0	25000	(trips) x (miles/trip)

		Emission Factor (g/mi)				
Vehicle Type		CO	VOC	NOx	SOx	PM
HDDV		20.26	5.60	18.53	0.09	1.65

Pavement Hauling Emissions (FY06)

		Emissions (tons/year)				
	Total Miles	CO	VOC	NOx	SOx	PM
Alternative A	0	0.0	0.0	0.0	0.0	0.0
Alternative B	0	0.0	0.0	0.0	0.0	0.0
Alternative C	25000	0.6	0.2	0.5	0.0	0.0

Predator EA - Emission Calculations

Paving

Installation of New Asphalt (FY06)

Paving Rate 5000 (sq ft/day)

Workday 8 (hr/day)

	Alt A	Alt B	Alt C
Days of paving activity	0	0	10
Hours of paving activity	0	0	80

		Emission Factor (lb/hour)				
Equipment		CO	ROC	NOx	SOx	PM10
Bulldozer		2.100	0.420	4.411	0.420	0.105
Asphalt Paver		0.376	0.054	1.235	0.107	0.054
Roller		0.300	0.065	0.870	0.067	0.050

Alternative A			Emissions (tons/year)				
Equipment	# Eq	Hours	CO	ROC	NOx	SOx	PM10
Bulldozer	1	0	0.0	0.0	0.0	0.0	0.0
Asphalt Paver	1	0	0.0	0.0	0.0	0.0	0.0
Roller	1	0	0.0	0.0	0.0	0.0	0.0

Alternative B			Emissions (tons/year)				
Equipment	# Eq	Hours	CO	ROC	NOx	SOx	PM10
Bulldozer	1	0	0.0	0.0	0.0	0.0	0.0
Asphalt Paver	1	0	0.0	0.0	0.0	0.0	0.0
Roller	1	0	0.0	0.0	0.0	0.0	0.0

Alternative C			Emissions (tons/year)				
Equipment	# Eq	Hours	CO	ROC	NOx	SOx	PM10
Bulldozer	1	80	0.1	0.0	0.2	0.0	0.0
Asphalt Paver	1	80	0.0	0.0	0.0	0.0	0.0
Roller	1	80	0.0	0.0	0.0	0.0	0.0

Total Emissions - Paving Operation (FY06)

	Emissions (tons/year)				
	CO	ROC	NOx	SOx	PM10
Alternative A	0.0	0.0	0.0	0.0	0.0
Alternative B	0.0	0.0	0.0	0.0	0.0
Alternative C	0.7	0.2	0.8	0.0	0.1

FY06 Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0
0.7	0.0	0.8	0.1	0.2

Emissions Summary

Alternative A						
	Emissions (tons/year)					
Source	**CO**	**SOx**	**NOx**	**PM**	**VOC**	
Construction (Infrastructure)	9.3	0.0	42.9	3.0	2.9	
Grading				58.0		
Paving (Runway & Taxiway)	2.9	0.1	3.4	0.24	0.8	
Total Construction (FY03)	**12.3**	**0.1**	**46.3**	**61.3**	**3.7**	(FY03)
Construction (Infrastructure)	6.5	0.0	29.8	2.1	2.0	
Grading				58.0		
Paving (Runway & Taxiway)						
Total Construction (FY04)	**6.5**	**0.0**	**29.8**	**60.1**	**2.0**	(FY04)
Construction (Infrastructure)	6.6	0.0	30.4	2.2	2.1	
Grading				58.0		
Paving (Runway & Taxiway)	0.9	0.0	1.1	0.1	0.2	
Total Construction (FY05)	**7.5**	**0.0**	**31.4**	**60.2**	**2.3**	(FY05)
Construction (Infrastructure)	9.9	0.0	45.7	3.2	3.1	
Grading				58.0		
Paving (Runway & Taxiway)	0.0	0.0	0.0	0.0	0.0	
Total Construction (FY06)	**9.9**	**0.0**	**45.7**	**61.2**	**3.1**	(FY06)
Commuting POV (only)	11.3	0.003	0.9	0.04	1.5	
Commuting POV-to-Bus	4.5	0.001	0.4	0.02	0.6	
Commuting Busses	0.7	0.003	0.4	0.06	0.2	
Aircraft (TGO+LTO)	103.0	0.1	0.8	0.2	1.8	(Airfield, near ground-level)
Ground Support Equipment	7.7	2.4	35.7	2.5	2.9	
Total Operation	**127.2**	**2.4**	**38.2**	**2.8**	**6.9**	
Aircraft (R-4806W)	236.6	0.2	2.9	0.5	3.0	(15,000 ft AGL)

Predator EA - Emission Calculations

Emissions Summary (ISAFAF)

Alternative B						
	Emissions (tons/year)					
Source	**CO**	**SOx**	**NOx**	**PM**	**VOC**	
Construction (Infrastructure)	9.3	0.0	42.9	3.0	2.9	
Grading				58.0		
Paving (Runway & Taxiway)	2.9	0.1	3.4	0.24	0.8	
Total Construction (FY03)	**12.3**	**0.1**	**46.3**	**61.3**	**3.7**	(FY03)
Construction (Infrastructure)	6.5	0.0	29.8	2.1	2.0	
Grading				58.0		
Paving (Runway & Taxiway)						
Total Construction (FY04)	**6.5**	**0.0**	**29.8**	**60.1**	**2.0**	(FY04)
Construction (Infrastructure)	6.6	0.0	30.4	2.2	2.1	
Grading				58.0		
Paving (Runway & Taxiway)	0.9	0.0	1.1	0.1	0.2	
Total Construction (FY05)	**7.5**	**0.0**	**31.4**	**60.2**	**2.3**	(FY05)
Construction (Infrastructure)	9.9	0.0	45.7	3.2	3.1	
Grading				58.0		
Paving (Runway & Taxiway)	0.0	0.0	0.0	0.0	0.0	
Total Construction (FY06)	**9.9**	**0.0**	**45.7**	**61.2**	**3.1**	(FY06)
Commuting POV (only)	15.9	0.004	1.3	0.1	2.2	
Commuting POV-to-Bus	6.4	0.001	0.5	0.0	0.9	
Commuting Busses	1.0	0.005	0.6	0.1	0.3	
Aircraft (TGO+LTO)	108.4	0.1	1.7	0.3	2.4	(Airfield, near ground-level)
Ground Support Equipment	9.8	3.0	45.4	3.2	3.6	
Total Operation	**141.5**	**3.2**	**49.5**	**3.7**	**9.3**	
Aircraft (R-4806W)	267.0	0.4	6.4	1.0	3.3	(15,000 ft AGL)

Emissions Summary (ISAFAF)

Alternative C						
	Emissions (tons/year)					
Source	**CO**	**SOx**	**NOx**	**PM**	**VOC**	
Construction (Infrastructure)	0.0	0.0	0.0	0.0	0.0	
Grading				28.1		
Paving (Runway & Taxiway)	1.3	0.1	1.5	0.11	0.35	
Total Construction (FY03)	**1.3**	**0.1**	**1.5**	**28.2**	**0.4**	(FY03)
Construction (Infrastructure)	0.0	0.0	0.0	0.0	0.0	
Grading						
Paving (Runway & Taxiway)						
Total Construction (FY04)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	(FY04)
Construction (Infrastructure)	0.0	0.0	0.0	0.0	0.0	
Grading				28.1		
Paving (Runway & Taxiway)	0.9	0.0	1.1	0.1	0.2	
Total Construction (FY05)	**0.9**	**0.0**	**1.1**	**28.1**	**0.2**	(FY05)
Construction (Infrastructure)	4.4	0.0	20.2	1.4	1.4	
Grading				28.1		
Paving (Runway & Taxiway)	0.7	0.0	0.8	0.1	0.2	
Total Construction (FY06)	**5.1**	**0.0**	**21.0**	**29.6**	**1.6**	(FY06)
Commuting POV (only)	-62.4	-0.01	-5.1	-0.2	-8.5	
Commuting POV-to-Bus	-25.0	-0.01	-2.0	-0.1	-3.4	
Commuting Busses	-3.7	-0.02	-2.2	-0.3	-1.0	
Aircraft (TGO+LTO)	-15.1	0.1	0.9	0.1	0.3	(Airfield, near ground-level)
Ground Support Equipment	0.7	0.2	3.4	0.2	0.3	
Total Operation	**-105.5**	**0.3**	**-4.9**	**-0.3**	**-12.3**	
Aircraft (R-4806W)	-47.1	0.3	3.2	0.4	-0.6	(15,000 ft AGL)

Emissions Summary

Alternative A						
	Emissions (tons/year)					
Source	**CO**	**SOx**	**NOx**	**PM**	**VOC**	
Aircraft (R-2508)	90.4	0.1	0.9	0.2	1.1	(15,000 ft AGL)
Total	**90.4**	**0.1**	**0.9**	**0.2**	**1.1**	

Alternative B						
	Emissions (tons/year)					
Source	**CO**	**SOx**	**NOx**	**PM**	**VOC**	
Aircraft (R-2508)	75.0	0.1	1.5	0.3	0.9	(15,000 ft AGL)
Total	**75.0**	**0.1**	**1.5**	**0.3**	**0.9**	

Alternative C						
	Emissions (tons/year)					
Source	**CO**	**SOx**	**NOx**	**PM**	**VOC**	
Aircraft (R-2508)	-6.7	0.0	0.5	0.1	-0.1	(15,000 ft AGL)
Total	**-6.7**	**0.0**	**0.5**	**0.1**	**-0.1**	

Emissions Summary

Alternative A						
	Emissions (tons/year)					
Source	**CO**	**SOx**	**NOx**	**PM**	**VOC**	
Construction	0.4	0.0	1.7	0.1	0.1	(FY06)
Grading				0.017		
Total	**0.4**	**0.0**	**1.7**	**0.1**	**0.1**	

Alternative B						
	Emissions (tons/year)					
Source	**CO**	**SOx**	**NOx**	**PM**	**VOC**	
Construction	0.4	0.0	1.7	0.1	0.1	(FY06)
Grading				0.017		
Total	**0.4**	**0.0**	**1.7**	**0.1**	**0.1**	

Alternative C						
	Emissions (tons/year)					
Source	**CO**	**SOx**	**NOx**	**PM**	**VOC**	
Construction	0.0	0.0	0.0	0.0	0.0	(FY06)
Grading				0.0		
Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	